Supreme Court, U.S.
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No. _____

In The
Supreme Court of the United States

October Term, 1997

RUSSELL HUNTER,
Petitioner

v.

STATE OF CONNECTICUT,
Respondent

PETITION FOR WRIT OF CERTIORARI TO THE SUPREME COURT OF THE UNITED STATES OF AMERICA

PETITION FOR A WRIT OF CERTIORARI

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QUESTION PRESENTED

DID THE CONNECTICUT SUPREME COURT ERR IN DENYING THE DEFENDANT AN EVIDENTIARY HEARING BY HOLDING POLYGRAPH EVIDENCE PER SE INADMISSIBLE, THUS VIOLATING THE DEFENDANT'S CONSTITUTIONAL RIGHTS OF DUE PROCESS UNDER THE FOURTEENTH AMENDMENT TO THE UNITED STATES CONSTITUTION AND HIS RIGHT TO PRESENT A DEFENSE UNDER THE SIXTH AMENDMENT TO THE UNITED STATES CONSTITUTION?

TABLE OF CONTENTS

	Page
QUESTION PRESENTED	i
TABLE OF CONTENTS.	ii
TABLE OF AUTHORITIES	iii
OPINIONS BELOW	1
JURISDICTION	1
CONSTITUTIONAL & STATUTORY PROVISIONS	1
STATEMENT OF THE CASE.	2
REASON FOR GRANTING THE PETITION . .	9
CONCLUSION	19

TABLE OF AUTHORITIES

TABLE OF CASES

	Pages
Armstrong v. Manzo, 380 U.S. 545, 552, 85 S. Ct. 1187, 14 L. Ed. 2d 62 (1965).	13,
Chambers v. Mississippi, 410 U.S. 284, 93 S. Ct. 1038 (1973).	9,
Daubert v. Merrill Dow Pharmaceuticals, Inc., 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993).	6,7,
Faretta v. California, 422 U.S. 806, 818 (1975).	10,
Frye v. United States, 293 F. 1013 (D.C. Cir. 1923).	6
Hawkins v. United States, 358 U.S. 74, 79 S. Ct. 136, 140 L. Ed. 2d 125 (1958).	14,
In re Oliver, 333 U.S. 257, 273 (1948).	10,
Rock v. Arkansas, 483 U.S. 44, 107 S. Ct. 2704, 97 L. Ed. 2d 37 (1987).	11,12,

TABLE OF CASES

	Pages
State v. Porter, ___ A.2d ___, 241 Conn. 57 (1997).	8,13, 17,
State v. Russell Hunter, ___ A.2d ___, 241 Conn. 165 (1997).	1,5,6, 8,9,
State v. Mobley, 44 M.J. 453 (C.M.A. 1996).	16,
United States v. Cordoba, 104 F.3d 225 (9th Cir. 1997).	15,
United States v. Piccinonna, 885 F.2d 1529 (11th Cir. 1989).	13,14,
Unites States v. Posado, 57 F.3d 428 (5th Cir. 1995).	14,15,
United States v. Scheffer, 44 M.J. 442 (C.M.A. 1996).	16,17,
Washington v. Texas, 388 U.S. 14, 87 S. Ct. 1920, 18 L. Ed. 1019 (1967).	9,11,

OPINION BELOW

The opinion of the Supreme Court of the State of Connecticut is reported in State v. Russell Hunter, ___ A.2d ___, 241 Conn. 165 (1997). App. A, infra.

JURISDICTION

The judgment and opinion of the Supreme Court of the State of Connecticut was released on May 20, 1997. The jurisdiction of this court is invoked under Title 28, U.S.C. §1257(a)(3).

CONSTITUTIONAL AND STATUTORY PROVISIONS INVOLVED

Amendment VI of the United States Constitution provides in relevant part:

> In all criminal prosecutions, the accused shall enjoy the right... to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in

> his favor, and to have the Assistance of Counsel for his defence.

Amendment XIV of the United States Constitution provides in relevant part:

> ...nor shall any State deprive any person of life, liberty, or property, without due process of law;...

The Connecticut statute under which the defendant was prosecuted is C.G.S. §53a-134, App. C, infra.

STATEMENT OF THE CASE

The defendant was arrested by members of the Waterbury Police Department for an alleged robbery which occurred on December 6, 1992 at Morcey's Restaurant in Waterbury, Connecticut. The defendant was charged by substitute information with the crime of robbery in the first degree, pursuant to § 53a-134 of the Connecticut General Statutes, before

the Superior Court in the Judicial District of Waterbury.

In the instant case, the defendant consistently denied prior to trial, and continues to deny, any involvement in the robbery which allegedly took place at Morcey's Restaurant in Waterbury, Connecticut.

On April 14, 1993, Victor Kaufman, the founder and Chief Examiner of New York Lie Detection Laboratories, administered a polygraph examination and issued a report of his findings. The report stated in pertinent part:

> The following questions were asked and the indicated answers were given.
>
> On December 6th, 1992, did you take any money out of Morcey's Restaurant, 572 Watertown Avenue? No.
>
> On December 6th 1992, did you rob Morcey's Restaurant, 572 Watertown Avenue? No.

> On December 6th 1992, were you inside Morcey's Restaurant, 572 Watertown Avenue? No.
> See, Appendix I, infra.

Mr. Kaufman concluded,

> No deception was indicated in this examinee's recorded responses to the above relevant questions and it is this polygraphist's opinion that Russell Hunter answered all of these questions truthfully.
> See, Appendix I, infra.

Based upon the results of said examination, the defendant filed a Motion to Admit Results of Polygraph Examination at Trial. A hearing on said Motion was held on December 1, 1993.

Prior to trial, the court, Fasano, J., denied the defendant's motion for an evidentiary hearing to admit into evidence the result of his polygraph examination. See, Appendix J, infra. Thereafter, the matter was tried to a jury of six before Fasano, J. The

defendant was found guilty of robbery in the first degree[1] and sentenced to sixteen years incarceration, suspended after nine years, with three years probation.

The defendant appealed his conviction to the Appellate Court for the State of Connecticut. The Appellate Court, (O'Connell, Lavery, and Landau, Js.) affirmed the judgement of the trial court.[2]

The defendant, upon the granting of certification, appealed his conviction to the Supreme Court for the State of Connecticut.[3] The Connecticut

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[1]The defendant was convicted on the criminal charge of robbery in the first degree in violation of §53a-134(a)(4) of the Connecticut General Statutes.

[2]State v. Hunter, 655 A.2d 291, 37 Conn. App. 907 (1995).

[3]The Connecticut Supreme Court granted the defendant's petition for

Supreme Court affirmed the decision of the Connecticut Appellate Court.[4]

The Connecticut Supreme Court sitting en banc affirmed the decision of the lower courts and issued its decision in conjunction with the companion case of State v. Porter, ___

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certification to appeal from the Appellate Court, limited to the following issues: "Under the circumstances of this case:

1. Did the Appellate Court properly conclude that the trial court was correct in denying the defendant's request for an evidentiary hearing regarding the admissibility of the defendant's polygraph evidence?

2. Should this court reconsider the applicability of the test for determining the admissibility of scientific evidence as set forth in Frye v. United States, 293 F. 1013 (D.C. Cir. 1923), in light of the United States Supreme Court's decision in Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 113 S. Ct. 2768, 125 L. Ed. 2d 469 (1993)? State v. Hunter, 670 A.2d 1307, 236 Conn. 907 (1996).

[4]State v. Hunter, ___ A.2d ___, 241 Conn. 165 (1997).

A.2d ___, 241 Conn. 57 (1997). The court held that:

1. The standard for the admissibility of scientific evidence as set forth by the United States Supreme Court in Daubert v. Merrell Dow Pharmaceuticals, Inc., (509 U.S. 579) should govern the admissibility of scientific evidence in Connecticut; under that standard, before proffered scientific evidence may be admitted, the trial court must determine that it is reliable, i.e., that the underlying theory or methodology is scientifically valid, and that the evidence is relevant, i.e., that the underlying reasoning or methodology properly can be applied to the facts in the case.
2. The defendant could not prevail on his claim that Connecticut should abandon its traditional per se rule against the admission of polygraph evidence at trial; the prejudicial impact of that evidence should remain per se inadmissible in all trial court proceedings in which the rules of evidence apply and for all trial purposes in Connecticut courts.
3. The defendant was not deprived of his federal constitutional right to present a defense by the trial court's exclusion of his favorable polygraph results without at least having conducted an evidentiary hearing regarding the

> reliability of his polygraph examination; there is a very strong basis for excluding polygraph evidence, such an exclusion is not arbitrary in light of the demonstrated unreliability of polygraph tests, and an evidentiary hearing on the offer of proof would have been a "nugatory undertaking." State v. Porter, ___ A.2d ___, 241 Conn. 57 (1997).

However, in a lone dissent, Justice Berdon, held that the majority, by adopting its per se rule, denied the defendant his right to a hearing on the admissibility of exculpatory polygraph evidence, and thus violated the defendant's due process rights and his right to present a defense under both the federal and state constitutions.[5]

The defendant, Russell Hunter, now petitions this court for certiorari to review the judgement of the Connecticut Supreme Court with respect to the

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[5]See, State v. Hunter, 241 Conn. at 169 (Berdon, J. dissenting).

denial of his federal constitutional rights, specifically, his Sixth Amendment right to present a defense and his Fourteenth Amendment right to due process.

REASONS FOR GRANTING THE PETITION

The petitioner submits that Connecticut Supreme Court ruling in State v. Hunter, 241 Conn. 165 (1997), violated the defendant's right to compulsory process as guaranteed by the Sixth Amendment to the federal constitution and applied to the states through the Fourteenth Amendment, by denying the defendant his right to present a defense.

The right to present a defense includes the right to present evidence on a defendant's behalf and the offering of testimony of witnesses. Chambers v. Mississippi, 410 U.S. 284

(1973); Washington v. Texas, 388 U.S. 14, 87 S. Ct. 1920, 18 L. Ed. 1019 (1967). Thus, the petitioner contends, in the instant case, that his constitutional right to present a defense included the right to make an offer of proof of favorable polygraph results. Therefore, the petitioner submits that by denying him the opportunity to demonstrate before the trial court the reliability of polygraph evidence, his sixth amendment rights were violated.

> The right to notice, confrontation and compulsory process, when taken together, guarantee that a criminal charge may be answered in a manner now considered fundamental to the fair administration of American justice..." Faretta v. California, 422 U.S. 806, 818 (1975).

Justice Black, in writing for this Court in In re Oliver, 333 U.S. 257, 273 (1948) identified these rights as

among the minimum essential for a fair trial.

> Just as an accused has the right to confront the prosecution's witnesses for the purpose of challenging their testimony, he has the right to present his own witnesses to establish a defense. This right is a fundamental element of due process of law. Washington v. Texas, 388 U.S. 14, 19, 87 S. Ct. 1920, 18 L. Ed. 2d 1019 (1967)(holding that state evidentiary rules which barred the testimony of co-participants in a crime from testifying for one another, from presenting a witness' testimony that the witness, not the defendant, shot the victim, denied the defendant of a fair trial). Id.

Therefore, the defendant argues that the court, in denying the defendant's motion for an evidentiary hearing, arbitrarily denied him the opportunity to present relevant and material testimony in his defense of criminal charges.

In Rock v. Arkansas, 483 U.S. 44, 107 S. Ct. 2704, 97 L. Ed. 2d 37

(1987), this Court held that the defendant's Sixth Amendment right under the federal constitution to present a defense was violated when she was deprived of the opportunity to call herself as a witness to testify on her own behalf, despite the fact that her memory was hypnotically refreshed.

> A State's legitimate interest in barring unreliable evidence does not extend to per se exclusions that may be reliable in an *individual* case..." Id., at 61 (emphasis added).

The Court failed to grant the defendant an opportunity to demonstrate the admissibility of his polygraph evidence via an evidentiary hearing. Mr. Hunter's polygraph examination results were crucial to his defense, in that the results were probative on the ultimate issue. In fact, Justice

Berdon noted in his dissenting opinion that,

> ... the defendant was never given an opportunity to either develop the factual basis for his claim, or, equally important, an opportunity to argue the validity of an appropriately administered polygraph." State v. Porter, 241 Conn. at 141.
>
> [Furthermore,] [w]ithout giving the defendant an opportunity to demonstrate the scientific underpinnings and the accuracy of the polygraph, this court not only deprives the defendant of his constitutional right to present a defense,[] but also his right to be heard at a meaningful time and in a meaningful manner-- both rights which, of course, are at the core of due process under the federal and state constitutions. Armstrong v. Manzo, 380 U.S. 545, 552, 85 S. Ct.1187, 14 L. Ed. 2d 62 (1965); (citation omitted). Id.

Moreover, the defendant submits that there is substantial authority which justifies affording the defendant an opportunity for a hearing on the admissibility of polygraph evidence. In United States v. Piccinonna, 885

F.2d 1529 (11th Cir. 1989), the Eleventh Circuit Court of Appeals, prior to Daubert, abandoned a per se exclusionary rule regarding polygraph evidence.

> Thus, even under a strict adherence to the traditional Frye standard, we believe it is no longer accurate to state categorically that polygraph testing lacks general acceptance for use in all circumstances. For this reason, we find it appropriate to reexamine the per se exclusionary rule and institute a rule more in keeping with the progress made in the polygraph field. Id., at 1532.
>
> However, as Justice Potter Stewart wrote, "any rule that impedes the discovery of truth in a court of law impedes as well the doing of justice." Hawkins v. United States, 358 U.S. 74, 79 S. Ct. 136, 140 L. Ed. 2d 125 (1958) (Stewart, J., concurring). Id., at 1535.

In addition, the Fifth Circuit Court of Appeals, in Unites States v. Posado, 57 F.3d 428, 433-432 (5th Cir. 1995), abandoned the per se rule

against the admissibility of polygraph evidence:

> After Daubert, a per se rule is not viable... We merely remove the obstacle of the per se rule against admissibility, which was based on antiquated concepts about the technical ability of the polygraph and legal precepts that have been expressly overruled by the Supreme Court. (citation omitted). Id., at 432.

Most recently, the Ninth Circuit Court of Appeals in United States v. Cordoba, 104 F.3d 225, 228 (9th Cir. 1997), abandoned a per se rule against the admissibility of polygraph evidence, reversing a "bright line rule" excluding all unstipulated polygraph evidence offered in civil or criminal trials.

> Requiring the trial judge to conduct the Rule 403 analysis is consistent with the law of other circuits. While the Fifth and Sixth Circuits disfavor admission of unstipulated polygraph evidence, under Rule 403 when the evidence is introduced to bolster

> credibility, these circuits still require the trial judge to conduct a balancing test under Rule 403. Other circuits simply require the trial court to conduct a balancing test under Rule 403 before admitting polygraph evidence. Id.

Furthermore, the United States Court of Appeals for the Armed Forces in United States v. Scheffer, 44 M.J. 442 (C.M.A. 1996),[6] held that a military rule of evidence that excluded polygraph test results violated a defendant's right to produce a defense as secured by the Sixth Amendment to the United States Constitution.

> The Sixth Amendment grants an accused the "right to call 'witnesses in his favor.'" An accused's right to present testimony that is relevant and material may not be denied arbitrarily.(internal citations omitted). Id., at 445.

Further, the Scheffer court reasoned,

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[6]See also, State v. Mobley, 44 M.J. 453, 454-45 (C.M.A. 1996)(companion case to Scheffer).

> We believe that the truth-seeking function is best served by keeping the door open to scientific advances... "whether polygraph technique can be said to have made sufficient technological advances in the seventy years since Frye to constitute the type of 'scientific, technical, or other specialized knowledge'... [w]e will never know unless we give appellant an opportunity to lay the foundation. (internal citations omitted) Id., at 446.

The Scheffer court, in relying on Rock v. Arkansas, supra, 483 U.S. 61, stated,

> [w]hile Rock concerned exclusion of a defendant's testimony and this case concerns exclusion of evidence supporting the truthfulness of a defendant's testimony, we perceive no significant constitutional difference between the two. In either case, the Sixth Amendment right to present a defense is implicated. Id., at 446.

Therefore, the defendant argues that,

> [w]here credibility is as critical as in the instant case, the circumstances are such as to make the polygraph evidence materially exculpatory within the meaning of the Federal Constitution.

(internal citation omitted) State v. Porter, 241 Conn. at 163.

Thus, the Connecticut courts have erred in denying the defendant an opportunity for a hearing on the admissibility of favorable polygraph results performed at a meaningful time and in a meaningful manner.

The defendant submits that the Connecticut Supreme Court should have reversed the lower courts, remanding the matter back to the trial court with instructions to conduct an evidentiary hearing as to the admissibility of polygraph evidence under the Daubert approach adopted by the Court therein. Furthermore, the Connecticut Supreme Court should have instructed the trial court to evaluate the relevancy, reliability, and accuracy of this defendant's polygraph results under the

circumstances of his case and thus abandon a per se rule of exclusion.

CONCLUSION

For all the foregoing reasons, the petitioner's writ of certiorari should properly be ordered granted.

Respectfully submitted,

THE PETITIONER, RUSSELL HUNTER

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Dated: August 16, 1997

No. _____

In The
Supreme Court of the United States

October Term, 1997

RUSSELL HUNTER,
Petitioner

v.

STATE OF CONNECTICUT,
Respondent

APPENDIX TO
PETITION FOR WRIT OF CERTIORARI
TO THE SUPREME COURT OF THE
UNITED STATES OF AMERICA

PETITION FOR WRIT OF CERTIORARI

APPENDIX A

VI

In conclusion, I would remand this case to the trial court in order to furnish the defendant with an opportunity to prove the validity of his polygraph examination and to demonstrate that it was correctly administered in this case. Both the state and the defendant should have the opportunity to be heard on the issue of accuracy and the conditions for the admissibility of the polygraph evidence. Only then do I believe that a court would be in the position to rule on its admissibility. "Where credibility is as critical as in the instant case, the circumstances are such as to make the polygraph evidence materially exculpatory within the meaning of the [federal] [c]onstitution." *McMorris* v. *Israel*, supra, 643 F.2d 462.

Accordingly, I dissent with respect to the issue of the admissibility of polygraph evidence.

STATE OF CONNECTICUT *v.* RUSSELL C. HUNTER
(SC 15364)

Callahan, C. J., and Borden, Berdon, Norcott, Katz, Palmer and McDonald, Js.

Syllabus

Convicted of the crime of robbery in the first degree, the defendant appealed to the Appellate Court, which affirmed the judgment of the trial court, and the defendant, on the granting of certification, appealed to this court. *Held* that, for the reasons expressed by this court in *State* v. *Porter* (241 Conn. 57), the Appellate Court properly affirmed the trial court's exclusion of the results of the defendant's exculpatory polygraph examination without first having conducted an evidentiary hearing.

(One justice concurring and dissenting)

Argued September 24, 1996—officially released May 20, 1997

Procedural History

Substitute information charging the defendant with the crime of robbery in the first degree, brought to the

Superior Court in the judicial district of Waterbury, where the court, *Fasano, J.*, denied the defendant's motion to admit into evidence the results of his polygraph examination; thereafter, the matter was tried to the jury before *Fasano, J.*; verdict and judgment of guilty, from which the defendant appealed to the Appellate Court, *O'Connell, Lavery* and *Landau, Js.*, which affirmed the trial court's judgment, and the defendant, on the granting of certification, appealed to this court. *Affirmed.*

Richard M. Marano, for the appellant (defendant).

Lisa Herskowitz, deputy assistant state's attorney, with whom were *Kevin T. Kane*, state's attorney, and, on the brief, *John Connelly*, state's attorney, and *Maureen Keegan*, assistant state's attorney, for the appellee (state).

Opinion

BORDEN, J. This appeal is a companion to the appeal in *State* v. *Porter*, 241 Conn. 57, A.2d (1997). The issues in this certified appeal are: (1) whether Connecticut should adopt as the standard for the admissibility of scientific evidence the standard set forth by the United States Supreme Court in *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993); and (2) whether Connecticut should abandon its traditional per se rule that polygraph evidence is inadmissible at trial. The defendant, Russell C. Hunter, appeals from the judgment of the Appellate Court affirming his conviction for robbery in the first degree in violation of General Statutes § 53a-134 (a) (4).[1] Prior to trial, the defendant had moved to admit

[1] General Statutes § 53a-134 provides in pertinent part: "Robbery in the first degree: Class B felony. (a) A person is guilty of robbery in the first degree when, in the course of the commission of the crime of robbery as defined in section 53a-133 or of immediate flight therefrom, he or another participant in the crime . . . (4) displays or threatens the use of what he

the results of an exculpatory polygraph examination. The trial court denied the defendant's motion and, on the defendant's postconviction appeal, the Appellate Court affirmed the trial court's judgment. *State* v. *Hunter*, 37 Conn. App. 907, 655 A.2d 291 (1995). This certified appeal followed.[2]

The defendant claims that: (1) the Appellate Court incorrectly concluded that the trial court properly denied his request for an evidentiary hearing regarding the admissibility of polygraph evidence; and (2) in light of the United States Supreme Court's decision in *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 579, this court should reconsider its test for determining the admissibility of scientific evidence, which is currently based on *Frye* v. *United States*, 293 F. 1013 (D.C. Cir. 1923), and should conclude that polygraph evidence is admissible under the *Daubert* test. We address these precise claims in *State* v. *Porter*, supra, 241 Conn. 57, and for the reasons explained therein, we affirm the judgment of the Appellate Court.

The judgment of the Appellate Court is affirmed.

In this opinion CALLAHAN, C. J., and NORCOTT, KATZ, PALMER and MCDONALD, Js., concurred.

BERDON, J., concurring and dissenting. This appeal presents the same issue that was decided today in the

represents by his words or conduct to be a pistol, revolver, rifle, shotgun, machine gun or other firearm . . . ."

[2] We granted the defendant's petition for certification to appeal from the Appellate Court, limited to the following issues: "Under the circumstances of this case: 1. Did the Appellate Court properly conclude that the trial court was correct in denying the defendant's request for an evidentiary hearing regarding the admissibility of the defendant's polygraph evidence?

"2. Should this court reconsider the applicability of the test for determining the admissibility of scientific evidence set forth in *Frye* v. *United States*, 293 F. 1013 (D.C. Cir. 1923), in light of the United States Supreme Court's decision in *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993)?" *State* v. *Hunter*, 236 Conn. 907, 670 A.2d 1307 (1996).

companion case of *State* v. *Porter*, 241 Conn. 57, A.2d (1997), pertaining to the standard for the admissibility of scientific evidence and the right to a hearing in order for a trial court to determine the admissibility of polygraph evidence. The defendant, Russell Hunter, an African-American, was convicted of robbery in the first degree in violation of General Statutes § 53a-134 (a) (4). He was sentenced to sixteen years imprisonment, execution suspended after nine years.

The sole issue at trial was the identification of the defendant[1] as the person who committed the robbery. On April 14, 1993, the defendant submitted to a polygraph test administered by Victor C. Kaufman, a polygraphist and chief examiner with New York Lie Detection Laboratories. Kaufman is a charter member of the American Polygraph Examiners of New York State, the Empire State Polygraphy Society, the Virginia Polygraph Association, the Association of Police Polygraphists and the American Polygraph Association, and he has conducted more than 10,000 polygraph examinations since 1958. Kaufman administered a "four pen Lafayette polygraph procedure" to register changes in the blood pressure, rate and strength of pulse beat, galvanic skin response, and respiratory pattern of the defendant.

The pertinent questions asked during the defendant's polygraph examination, and the indicated answers, were as follows:

"On December 6, 1992 [the day of the robbery], did you take any money out of Morcey's Restaurant, 572 Watertown Avenue [the place of the robbery]?

"No.

[1] See footnote 4 of my concurring and dissenting opinion in *State* v. *Porter*, supra, 241 Conn. 138–39n.4, with respect to the inherent unreliability of cross-racial identification.

"On December 6, 1992, did you rob Morcey's Restaurant, 572 Watertown Avenue?

"No.

"On December 6, 1992, were you inside Morcey's Restaurant, 572 Watertown Avenue?

"No."

In his report, based upon the polygraph examination, Kaufman concluded: "No deception was indicated in this examinee's recorded responses to the above relevant questions and it is this polygraphist's opinion that Russell Hunter answered all these questions truthfully."

Several days before the defendant's trial, the trial court denied the defendant's motion to admit the polygraph results into evidence and held that the defendant was not entitled to a full hearing on the motion. The defendant subsequently testified at his trial that he did not participate in the robbery.

As I indicated in my concurring and dissenting opinion in *State* v. *Porter*, supra, 241 Conn. 145–47, upon adopting the standard set forth in *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 592–95, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993), for the admissibility of scientific evidence, the trial court should be the court to determine whether the polygraph evidence is admissible.

In my view, the majority, by adopting its per se rule, which denies the defendant a right to a hearing on the admissibility of exculpatory polygraph evidence, violates his due process rights and his right to present a defense under the federal and state constitutions. See *State* v. *Porter*, supra, 241 Conn. 161 (*Berdon, J.*, concurring and dissenting).

Accordingly, I dissent with respect to the issue of the admissibility of polygraph evidence.

APPENDIX B

STATE OF CONNECTICUT *v.* CHRISTIAN E. PORTER (SC 15363)

Callahan, C. J., and Borden, Berdon, Norcott, Katz, Palmer and McDonald, Js.

Syllabus

Convicted of the crime of arson in the first degree in connection with the destruction of his home by a fire of suspicious origin, the defendant appealed to the Appellate Court, which affirmed the judgment of the trial court, and the defendant, on the granting of certification, appealed to this court asserting that this state should reconsider the traditional rule that polygraph evidence is per se inadmissible at trial. *Held:*

1. The standard for admissibility of scientific evidence as set forth by the United States Supreme Court in *Daubert* v. *Merrill Dow Pharmaceuticals, Inc.* (509 U.S. 579) should govern the admissibility of scientific evidence in Connecticut; under that standard, before proffered scientific evidence may be admitted, the trial court must determine that it is reliable, i.e., that the underlying theory or methodology is scientifically valid, and that the evidence is relevant, i.e., that the underlying reasoning or methodology properly can be applied to the facts in the case.
2. The defendant could not prevail on his claim that Connecticut should abandon its traditional per se rule against the admission of polygraph evidence at trial; the prejudicial impact of that evidence being greatly in excess of its probative value, polygraph evidence should remain per se inadmissible in all trial court proceedings in which the rules of evidence apply and for all trial purposes in Connecticut courts.
3. The defendant was not deprived of his federal constitutional right to present a defense by the trial court's exclusion of his favorable polygraph results without at least having conducted an evidentiary hearing regarding the reliability of his polygraph examination; there is a very strong basis for excluding polygraph evidence, such an exclusion is not arbitrary in light of the demonstrated unreliability of polygraph tests, and an evidentiary hearing on the offer of proof would have been a "nugatory undertaking."

(One justice concurring and dissenting)

Argued September 24, 1996—officially released May 20, 1997

Procedural History

Substitute information charging the defendant with two counts of the crime of arson in the first degree, brought to the Superior Court in the judicial district of New London, where the court, *Parker, J.*, denied the

defendant's motion to admit into evidence the results of his polygraph examination; thereafter, the matter was tried to the jury before *Parker, J.*; verdict and judgment of guilty of one count of arson in the first degree; subsequently, the court denied the defendant's motion for a new trial, and the defendant appealed to the Appellate Court, *O'Connell, Landau* and *Hennessy, Js.*, which affirmed the judgment of the trial court, and the defendant, on the granting of certification, appealed to this court. *Affirmed.*

M. Hatcher Norris, with whom, on the brief, were *Joel M. Ellis, Peter W. Soulsby* and *Lee A. Gold*, legal intern, for the appellant (defendant).

Kevin T. Kane, state's attorney, with whom, were *Lisa Herskowitz*, deputy assistant state's attorney, and, on the brief, *William R. Jay*, certified legal intern, for the appellee (state).

Opinion

BORDEN, J. The issues in this certified appeal are: (1) whether Connecticut should adopt as the standard for the admissibility of scientific evidence the standard set forth by the United States Supreme Court in *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993); and (2) whether Connecticut should abandon its traditional per se rule that polygraph evidence is inadmissible at trial. The defendant, Christian E. Porter, appeals from the judgment of the Appellate Court affirming his conviction for arson in the first degree in violation of General Statutes § 53a-111 (a) (4). The defendant claims that: (1) the Appellate Court incorrectly concluded that the trial court properly denied his request for an evidentiary hearing regarding the admissibility of polygraph evidence; and (2) in light of the United States Supreme Court's decision in *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 579, this court should reconsider

its test for determining the admissibility of scientific evidence, which is currently based on *Frye* v. *United States*, 293 F. 1013 (D.C. Cir. 1923), and should conclude that polygraph evidence is admissible under the *Daubert* test. We conclude that *Daubert* provides the proper threshold standard for the admissibility of scientific evidence in Connecticut. We also conclude, however, on the basis of our own independent examination of the extensive literature and case law regarding polygraph evidence, that polygraph evidence should remain per se inadmissible in Connecticut trials, and consequently that an evidentiary hearing was not necessary to evaluate the reliability of such evidence. Accordingly, we affirm the judgment of the Appellate Court.

The following facts and procedural history are undisputed. The defendant's home in Norwich was destroyed by a fire on July 20, 1992. The defendant was subsequently charged with two counts of arson in the first degree in violation of § 53a-111 (a) (3) and (4).[1]

Before trial, the defendant retained Leighton Hammond, a polygrapher, to conduct a polygraph examination to determine whether the defendant was telling the truth when he claimed that he had no guilty knowledge of, and had not participated in, the burning of his home. The defendant did not give the state advance notification of the examination. The pertinent test questions asked of the defendant were: (1) "Did you set fire to your home?"; (2) "Did you tell even one lie, in your statement to the Norwich Police?"; and (3) "Do you know for sure, if any person deliberately set fire to your

[1] General Statutes § 53a-111 provides in relevant part: "Arson in the first degree: Class A felony. (a) A person is guilty of arson in the first degree when, with intent to destroy or damage a building, as defined in section 53a-100, he starts a fire or causes an explosion, and . . . (3) such fire or explosion was caused for the purpose of collecting insurance proceeds for the resultant loss; or (4) at the scene of such fire or explosion a peace officer or firefighter is subjected to a substantial risk of bodily injury. . . ."

home?" In the opinion of Hammond, the defendant was telling the truth when he answered "no" to each of these questions.

The defendant then moved that the trial court admit the results of the polygraph examination. After a hearing, the trial court denied the defendant's motion, stating that it was not the place of a trial court to reconsider Connecticut's traditional per se ban on the admissibility of polygraph evidence.

Following a jury trial, at which the defendant did not testify, he was convicted of arson in the first degree in violation of § 53a-111 (a) (4).[2] The defendant appealed from the judgment of conviction to the Appellate Court claiming, inter alia, that the trial court improperly had

[2] The dissent spends several pages recounting, and belittling, the state's evidence in this case, implicitly arguing that the supposed weakness of the state's case is relevant to the issue of the admissibility of the polygraph evidence. We fail to see, however, how the strength of the state's case, in and of itself, is relevant to the general legal question of the admissibility of polygraph evidence. Compare part II B 3 a and footnote 63 of this opinion. We are aware of no support for the proposition that the legal question of the admissibility of a particular type of evidence turns on the general strength of the opposing party's case.

In any event, we disagree with the dissent's characterization of the state's case. Indeed, the Appellate Court specifically rejected a sufficiency of the evidence claim raised by the defendant. *State* v. *Porter*, 39 Conn. App. 800, 803–805, 668 A.2d 725 (1995). The state presented testimony, which the jury was entitled to believe, that the damage to the defendant's house was caused by three independent and unconnected fires; that flammable liquid accelerants were present in all three locations; and that electricity did not cause any of the fires. Moreover, although not necessary in an arson prosecution, the state presented evidence of the defendant's financial motive for setting the fire. Specifically, the jury reasonably could have found that the defendant and his wife had falsified the amount and source of their income when applying for the mortgage loan to finance the purchase of the house, that the defendant's wife was unemployed and had stopped collecting unemployment benefits three months before the fire, and that the defendant and his wife had exhausted all of their savings by the time of the fire. From these facts, the jury reasonably could have concluded that the defendant's motive in setting the fire was not to collect the insurance proceeds himself, but to free himself from his obligations under the mortgage.

refused to admit the favorable results of his polygraph examination and further improperly had refused to allow him to make an evidentiary offer of proof on the polygraph results. *State* v. *Porter*, 39 Conn. App. 800, 801, 668 A.2d 725 (1995). The Appellate Court affirmed the trial court's judgment, concluding that "[t]he trial court, like this court, is bound by the Connecticut precedent which bars the admission of polygraph results. . . . Because an evidentiary hearing would have been a nugatory undertaking, the trial court was not required to grant the defendant's motion for an evidentiary offer of proof." (Citation omitted.) Id., 803. This certified appeal followed.[3]

I

The *Daubert* Standard

The defendant argues that Connecticut should adopt the federal test for the admissibility of scientific evidence, as set forth by the United States Supreme Court in *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 579.[4] We agree that, when read and applied correctly, *Daubert* provides the proper approach to the threshold admissibility of scientific evidence.

A

We begin with a general examination of the *Frye* and *Daubert* standards for the admission of scientific

[1] We granted the defendant's petition for certification to appeal from the Appellate Court, limited to the following issues: "Under the circumstances of this case: 1. Did the Appellate Court properly conclude that the trial court was correct in denying the defendant's request for an evidentiary hearing regarding the admissibility of the defendant's polygraph evidence?

"2. Should this court reconsider the applicability of the test for determining the admissibility of scientific evidence set forth in *Frye* v. *United States*, 293 F. 1013 (D.C. Cir. 1923), in light of the United States Supreme Court's decision in *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993)?" *State* v. *Porter*, 236 Conn. 908, 670 A.2d 1308 (1996).

[4] Indeed, the state agrees that "*Daubert*'s focus on evidentiary reliability . . . is a positive step away from the rigid application of *Frye* as a precondition of admissibility."

evidence. The standard enunciated in *Frye* v. *United States*, supra, 293 F. 1013, was predominant in both state and federal courts for the seventy years from its formulation until the decision in *Daubert* in 1993. *Frye* itself was a lie detector case; indeed, it was the first appellate case in the United States to address the admissibility of lie detector examination results. In *Frye*, the defendant appealed from his murder conviction on the grounds that the trial court had improperly disallowed expert testimony that he had passed a "systolic blood pressure deception test," the precursor of the modern polygraph examination.[5] See J. McCall, "Misconceptions and Reevaluation—Polygraph Admissibility After *Rock* and *Daubert*," 1996 U. Ill. L. Rev. 363, 367 (1996).

In considering the defendant's claim in *Frye*, the Court of Appeals for the District of Columbia first determined that "general acceptance" in the scientific community was a precondition to the admissibility of any scientific evidence. *Frye* v. *United States*, supra, 293 F. 1014. "Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the

[5] The systolic blood pressure deception test was simply a sphygmomanometer—a device that records blood pressure. The theory behind this device was that if a person lied, the resulting stress and fear of detection would cause that person's blood pressure to rise. J. Tarantino, Strategic Use of Scientific Evidence (1988) § 6.01, p. 205. The systolic blood pressure deception test was developed by William Marston, and was actually administered by Marston in *Frye*. Marston was also the creator of the "Wonder Woman" comic book character, who is well known for her truth-inducing magic lasso. R. Underwood, "Truth Verifiers: From the Hot Iron to the Lie Detector," 84 Ky. L.J. 597, 629 (1995–96).

particular field in which it belongs." Id. The court affirmed the trial court's exclusion of the systolic blood pressure evidence because the blood pressure device had "not yet gained such standing and scientific recognition among physiological and psychological authorities as would justify the courts in admitting expert testimony deduced from the discovery, development, and experiments thus far made." Id. Subsequently, *Frye* and its "general acceptance" standard were expressly adopted by a number of state and federal courts. See, e.g., *United States* v. *Alexander*, 526 F.2d 161 (8th Cir. 1975); *Pulakis* v. *State*, 476 P.2d 474 (Alaska 1970); see generally P. Giannelli, "The Admissibility of Novel Scientific Evidence: *Frye* v. *United States*, a Half-Century Later," 80 Colum. L. Rev. 1197, 1205 (1980).

In 1993, however, the federal standard for the admissibility of scientific evidence changed as a result of the decision of the United States Supreme Court in *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 579. In *Daubert*, the court held that rule 702[4] of the Federal Rules of Evidence, which was enacted in 1975, had superseded the *Frye* test. Id., 587. The court concluded that "[n]othing in the text of [rule 702] establishes 'general acceptance' as an absolute prerequisite to admissibility. . . . That austere standard, absent from, and incompatible with, the Federal Rules of Evidence, should not be applied in federal trials." (Citation omitted.) Id., 588–89.

Instead, a federal trial court has a responsibility to determine, pursuant to rule 702, whether the proffered evidence will "assist the trier of fact." Id., 589. This

[4] Rule 702 of the Federal Rules of Evidence provides: "Testimony by Experts

"If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify thereto in the form of an opinion or otherwise."

entails a two part inquiry: "whether the reasoning or methodology underlying the [scientific theory or technique in question] is scientifically valid and . . . whether that reasoning or methodology properly can be applied to the facts in issue." Id., 592–93. In other words, before it may be admitted, the trial judge must find that the proffered scientific evidence is both reliable and relevant.

More specifically, the first requirement for scientific evidence to be admissible under rule 702 is that the subject of the testimony must be scientifically valid, meaning that it is scientific knowledge rooted "in the methods and procedures of science"; id., 590; and is "more than subjective belief or unsupported speculation."[7] Id. This requirement "establishes a standard of evidentiary reliability"; id.; as, "[i]n a case involving scientific evidence, *evidentiary reliability* will be based upon *scientific validity*." (Emphasis in original.) Id., 590–91 n.9.

The court listed four nonexclusive factors for federal judges to consider in determining whether a particular theory or technique is based on scientific knowledge: (1) whether it can be, and has been, tested; (2) whether the theory or technique has been subjected to peer review and publication; (3) the known or potential rate of error, including the existence and maintenance of standards controlling the technique's operation; and (4) whether the technique is, in fact, generally accepted in the relevant scientific community. Id., 593–94. The court emphasized, however, that the inquiry is "a flexible one. Its overarching subject is the scientific validity—and thus the evidentiary relevance and reliability—of the principles that underlie a proposed submission." Id.,

[7] The court emphasized that "[t]he focus, of course, must be solely on principles and methodology, not on the conclusions that they generate." *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 595; see generally part I C 1 of this opinion.

594–95. Indeed, the court explicitly noted that other factors "may well have merit . . . [t]o the extent that they focus on the reliability of evidence as ensured by the scientific validity of its underlying principles . . . ." Id., 594–95 n.12.

The second condition that scientific evidence must satisfy in order to be admissible under rule 702 is that it must "fit" the case in which it is presented. Id., 591. In other words, proposed scientific testimony must be demonstrably relevant to the facts of the particular case in which it is offered, and not simply be valid in the abstract. "The study of the phases of the moon, for example, may provide valid scientific 'knowledge' about whether a certain night was dark, and if darkness is a fact in issue, the knowledge will assist the trier of fact. However (absent creditable grounds supporting such a link), evidence that the moon was full on a certain night will not assist the trier of fact in determining whether an individual was unusually likely to have behaved irrationally on that night." Id.

Finally, the court emphasized that even if a scientific theory or technique satisfied both of the previous criteria and thus would be admissible under a rule 702 analysis, it can still be excluded for failure to satisfy some other federal rule of evidence. Id., 595. Most important, it can still be excluded for failure to satisfy rule 403, which allows for the exclusion of relevant evidence " 'if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury . . . .' "[8] Id.

Because *Daubert* was premised on an interpretation of a federal rule of evidence, its rejection of *Frye* is not

[8] Rule 403 of the Federal Rules of Evidence provides: "Exclusion of Relevant Evidence on Grounds of Prejudice, Confusion, or Waste of Time

"Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of

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binding authority on state courts. Nonetheless, subsequent to the *Daubert* decision, several states that had theretofore followed *Frye* reconsidered the issue and adopted the *Daubert* standard. See, e.g., *State* v. *Alberico*, 116 N.M. 156, 861 P.2d 192, 201–203 (1993) ("The *Frye* test . . . has been a part of New Mexico evidence law since 1952 . . . . [T]he critical issue is whether the *Frye* test is a legitimate means for determining what is and what is not scientific knowledge. We hold that it is not and that the *Frye* test should be rejected as an independent controlling standard of admissibility. . . . Several factors could be considered by a trial court in assessing the validity of a particular scientific technique to determine if it is scientific knowledge . . . . See *Daubert* [v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 593–95] . . . ." [Citations omitted; internal quotation marks omitted.]).[9]

B

We now address the question of the proper standard for the threshold admissibility of scientific evidence in this state. We begin by noting that, at present, Connecticut nominally follows the *Frye* rule.[10] See, e.g., *State*

the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence."

[9] See also *Neuhart* v. *State*, 669 N.E.2d 953, 955 (Ind. 1996); *Cecil* v. *Commonwealth*, 888 S.W.2d 669, 675 (Ky. 1994); *State* v. *Foret*, 628 So. 2d 1116, 1123 (La. 1993); *Commonwealth* v. *Lanigan*, 419 Mass. 15, 25–26, 641 N.E.2d 1342 (1994); *Taylor* v. *State*, 889 P.2d 319, 328–39 (Okla. Crim. App. 1995); *State* v. *Hofer*, 512 N.W.2d 482, 484 (S.D. 1994); *State* v. *Brooks*, 162 Vt. 26, 30, 643 A.2d 226 (1994); *Craddock* v. *Watson*, 197 W. Va. 62, 475 S.E.2d 62, 66–67 (1996).

Several other states, which had already rejected *Frye* by the time *Daubert* was decided, have explicitly noted that their jurisprudence is already in conformance with the *Daubert* approach. See, e.g., *Jones* v. *State*, 314 Ark. 280, 294, 862 S.W.2d 242 (1993); *Nelson* v. *State*, 628 A.2d 69, 73 (Del. 1993); *State* v. *Quattrocchi*, 681 A.2d 879, 884 (R.I. 1996).

[10] See, e.g., J. Meaney, "From *Frye* to *Daubert*: Is a Pattern Unfolding?" 35 Jurimetrics J. 191, 194 (1995) (characterizing Connecticut as following *Frye* standard).

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v. *Sivri*, 231 Conn. 115, 153–54, 646 A.2d 169 (1994) (restriction fragment length polymorphism procedure as part of DNA analysis "generally accepted in the scientific community"); *State* v. *John*, 210 Conn. 652, 678, 557 A.2d 93, cert. denied, 493 U.S. 824, 110 S. Ct. 84, 107 L. Ed. 2d 50 (1989) (use of photographs by forensic entomologist to determine age of fly larvae found on body satisfied *Frye*); *State* v. *McClary*, 207 Conn. 233, 245–48, 541 A.2d 96 (1988) (testimony on "shaken baby syndrome" admissible under *Frye*); *State* v. *Sherman*, 38 Conn. App. 371, 409, 662 A.2d 767, cert. denied, 235 Conn. 905, 665 A.2d 905 (1995) ("Connecticut courts utilize the *Frye* standard in appraising the admissibility of evidence derived from innovative scientific techniques" [internal quotation marks omitted]).

A closer examination of our precedent, however, reveals that on many occasions we have declined to apply *Frye* when considering expert scientific testimony. See, e.g., *State* v. *Hasan*, 205 Conn. 485, 494, 534 A.2d 877 (1987) (admissibility of expert testimony by podiatrist that sneakers that left prints at crime scene belonged to defendant "did not depend on general acceptance of his theories in the scientific community"). Indeed, we have specifically observed that "[i]f a duly qualified expert testifies that in his opinion [a scientific] test or device is reliable, *but his opinion is not shared by the scientific community*, either because it is novel and experimental or because they disagree with its bases, *the court still has discretion to admit the evidence because competent proof is not rendered inadmissible merely by the fact that others take issue with it.*" (Emphasis added; internal quotation marks omitted.) *State* v. *Ortiz*, 198 Conn. 220, 227, 502 A.2d 400 (1985) (forensic odontologist's identification of person by bite mark on apple admissible).

It is clear that we have been moving toward a validity standard for a number of years. We believe that it is

time to complete that process, and that "the *Daubert* [reliability] approach will provide structure and guidance to what has until now been a potentially confusing and sparsely defined area of legal analysis in our state jurisprudence." *Taylor* v. *State*, 889 P.2d 319, 329 (Okla. Crim. App. 1995).[11] Accordingly, we conclude that the *Daubert* approach should govern the admissibility of scientific evidence in Connecticut.

I

We first discuss why a special standard for the admissibility of scientific evidence is required at all. Implicit in both *Frye* and *Daubert* is the notion that a trial judge should, by one method or another, serve as a "gatekeeper" and make a preliminary assessment of the validity of scientific testimony before allowing the fact finder even to consider it. A number of commentators, however, have suggested that the validity of proffered scientific evidence should go solely to its *weight*, not to its admissibility, and thus the fact finder should have a chance to consider all scientific evidence that is submitted. For example, the latest edition of Charles McCormick's treatise on evidence provides that in making *admissibility* determinations, "the traditional standards of relevancy and the need for expertise—and

[11] The Court of Criminal Appeals of Oklahoma, in addressing the issue of whether to abandon *Frye* in favor of *Daubert*, described a legal landscape regarding the admissibility of scientific evidence very similar to that which currently exists in Connecticut. The court observed that "[a] review of our pertinent caselaw reveals that this Court has not consistently relied upon *Frye* when faced with questions involving the admissibility of expert testimony describing novel scientific evidence. In fact, since adopting *Frye* in 1961, we have specifically cited to it in only six reported cases. While a number of our cases have mentioned the 'general acceptance' standard, several others appear to have utilized [a 'helpfulness' standard] in analyzing the admission of expert testimony describing novel scientific evidence." *Taylor* v. *State*, supra, 889 P.2d 328–29. The court decided to adopt *Daubert*. Id.

nothing more—should govern." 1 C. McCormick, Evidence (4th Ed. 1992) § 203, p. 874.[12]

Under this view, rule 702 of the Federal Rules of Evidence should not be interpreted as requiring judges independently to assess the validity of proffered scientific evidence, or to make admissibility decisions therefrom. Instead, "trial courts [should only] insure that expert witnesses are trustworthy—capable of explaining their reasoning in a manner that permits the factfinder to assess the testimony effectively—and so knowledgeable in their subject area that the inferences they draw are helpful. Thus, a court faced with scientific proof offers should not do what the jury does—that is, decide whether the evidence can be believed and how much of it should be believed. Instead, the court should consider whether the factfinder has enough information at its disposal to decide these issues for itself." R. Dreyfuss, "Is Science a Special Case? The Admissibility of Scientific Evidence After *Daubert v. Merrell Dow*," 73 Tex. L. Rev. 1779, 1801 (1995).

We disagree with the preceding analyses and conclude that the validity of the methodologies underlying proffered scientific evidence should be considered in determining the admissibility of such evidence, as well as in determining its weight. Accordingly, we also conclude that it is proper for a trial judge to serve a gatekeeper function.

a

In this regard, we first note the concern expressed by many authorities that juries will be overwhelmed by complex scientific evidence and will give such evidence

[12] There is a concession in McCormick's treatise that, like all other relevant evidence, relevant scientific testimony can be excluded for the "familiar [reasons] of prejudicing or misleading the jury or consuming undue amounts of time." 1 C. McCormick, supra, § 203, p. 875.

more weight than it deserves.[13] We acknowledge, however, that other commentators have specifically asserted that juries will *not* be overly impressed by such evidence.[14] At present, empirical data regarding the impact of scientific testimony on juries is almost entirely lacking. As a consequence, whether jurors will unduly credit scientific evidence is quite uncertain.[15]

[13] " 'Lay jurors tend to give considerable weight to "scientific" evidence when presented by "experts" with impressive credentials.' " *People* v. *Leahy*, 8 Cal. 4th 587, 595, 882 P.2d 321, 34 Cal. Rptr. 2d 663 (1994). This is so even though "juries usually lack any reliable or consistent basis for evaluating the credibility of expert witness testimony." "Developments in the Law—Confronting the New Challenges of Scientific Evidence," 108 Harv. L. Rev. 1481, 1509 (1995). Accordingly, juries "may defer too much to the opinion of experts if the subject matter is beyond common knowledge and everyday experience and if the opinion is given with the air of authority that commonly accompanies an expert's testimony." (Internal quotation marks omitted.) *State* v. *Cavaliere*, 140 N.H. 108, 109, 663 A.2d 97 (1995); see also *E.I. du Pont de Nemours & Co.* v. *Robinson*, 923 S.W.2d 549, 553 (Tex. 1995); P. Giannelli, supra, 80 Colum. L. Rev. 1239–40.

[14] These authorities believe that modern juries are technologically sophisticated enough not to be overwhelmed by scientific evidence. See, e.g., R. Dreyfuss, supra, 73 Tex. L. Rev. 1798; J. Sanders, "From Science to Evidence: The Testimony on Causation in the Bendectin Cases," 46 Stan. L. Rev. 1, 3 (1993) (concluding that faulty presentation, and not inherent difficulty of subject matter, is largely responsible for jury difficulties with scientific evidence).

[15] See D. Shuman, A. Champagne & E. Whitaker, "Juror Assessments of the Believability of Expert Witnesses: A Literature Review," 36 Jurimetrics J. 371, 382 (1996) ("Although the picture painted by the evolving social science research on juror assessments of the believability of experts is far from complete or consistent, an unsettling image emerges. The typical juror forms impressions of experts stereotypically, based on the occupation of the experts, and superficially, based on the personal characteristics of the experts.").

The authors of the preceding article themselves subsequently surveyed 156 jurors from cases in which scientific evidence had been presented. D. Shuman, A. Champagne & E. Whitaker, "Assessing the Believability of Expert Witnesses: Science in the Jurybox," 37 Jurimetrics J. 23 (1996). That study asked the jurors to rate the importance various factors had played in their assessment of expert scientific testimony. Id., 24–25. The study concluded that in assessing an expert's credibility, jurors properly placed the greatest emphasis on the expert's qualifications, familiarity with the case, quality of reasoning and impartiality. Id. 26, 27–28. The authors admit, however, that, because this study was based entirely on self-reporting by the jurors of what

Indeed, direct empirical evidence regarding the impact of scientific evidence on judges is also lacking.[16]

Although the effect of scientific evidence with regard to both judges and juries is uncertain, we note that, purely as a procedural matter, a judge is in a much better position than a juror to assess accurately the fundamental validity of such evidence. This is due to the different roles each serves at trial and the concomitant powers each has. "[T]he process of judicial decisionmaking, including the methods by which information is received and decisions are reviewed, is better suited than is the rather awkward process of juror decisionmaking for evaluation of evidence that is beyond at least the usual ken of laypeople, judges, and jurors alike." R. Friedman, "The Death and Transfiguration of *Frye*," 34 Jurimetrics J. 133, 144 (1994); see also B. Black, F. Ayala & C. Saffran-Brinks, "Science and the Law in the Wake of *Daubert*: A New Search for Scientific Knowledge," 72 Tex. L. Rev. 715, 787 (1994) ("we agree with *Daubert*'s preference for preliminary judicial screening only because judges are in a better position than juries to acquire and consider the kind of information that bears on the resolution of [scientific evidence] disputes").

For example, juries mainly have to rely on in-court testimony for their understanding of scientific evidence; that is, they are largely dependent upon the presentations of the parties and their experts. There is evidence, however, that expert presentations may often be mis-

factors they had considered important, it was possible that jurors who in fact "were impressed by witnesses (for irrational reasons)" were simply justifying their actions by "say[ing], after the fact, that these witnesses [were] familiar with the facts and use[d] good reasoning." Id., 28 n.20; see also P. Giannelli, supra, 80 Colum. L. Rev. 1240; cf. footnote 61 of this opinion.

[16] But see L. Loevinger, "Science as Evidence," 35 Jurimetrics J. 153, 186 (1995) (arguing that judges are better able to cope with scientific evidence); J. Sanders, "From Science to Evidence: The Testimony on Causation in the Bendectin Cases," 46 Stan. L. Rev. 1, 84 (1993).

leading; J. Sanders, "From Science to Evidence: The Testimony on Causation in the Bendectin Cases," 46 Stan. L. Rev. 1, 3 (1993); and, at the same time, that cross-examination of experts may often be difficult and ineffective in bringing out flaws in the expert's reasoning. B. Black, F. Ayala & C. Saffran-Brinks, supra, 72 Tex. L. Rev. 789; S. Gross, "Expert Evidence," 1991 Wis. L. Rev. 1113, 1172 (1991).

Judges, on the other hand, have the benefit of reviewing briefs and other documents. B. Black, F. Ayala & C. Saffran-Brinks, supra, 72 Tex. L. Rev. 788. Indeed, a Connecticut trial judge has the power to request supplemental briefing on any issue that needs clarification, including issues surrounding proffered scientific evidence. Furthermore, Practice Book § 881 explicitly authorizes a judge presiding over a criminal case to appoint an independent expert when necessary.[17] Such an appointment could certainly be made to assist the judge in evaluating proposed scientific testimony. Cf. *Taylor* v. *State*, supra, 889 P.2d 342 (Lumpkin, J., concurring).

[17] Practice Book § 881 provides: "—Judicial Appointment of Expert Witnesses

"Whenever the judicial authority deems it necessary, on its own motion it may appoint any expert witnesses of its own selection. An expert witness shall not be appointed by the judicial authority unless the expert consents to act. A witness so appointed shall be informed of his or her duties by the judicial authority in writing, a copy of which shall be filed with the clerk, or the witness shall be informed of his or her duties at a conference in which the parties shall have an opportunity to participate. A witness so appointed shall advise the parties of his or her findings, if any, and may thereafter be called to testify by the judicial authority or by any party. A witness so appointed shall be subject to cross-examination by each party. The judicial authority may determine the reasonable compensation for such a witness and direct payment out of such funds as may be provided by law. This section shall not apply to appointments made pursuant to Gen. Stat., § 54-56d."

We do not suggest, moreover, that this rule of practice limits any inherent judicial power that a trial court may also have to appoint an expert in an appropriate civil case.

Moreover, "[a]n important element in adjudication . . . is the development of judicial expertise through repeated exposure to and familiarity with similar scientific issues." J. Kesan, "An Autopsy of Scientific Evidence in a Post-*Daubert* World," 84 Geo. L.J. 1985, 2038 (1996). Judges, on the one hand, are likely to gain familiarity with various common procedures, and with scientific techniques in general, by virtue of presiding over multiple cases involving such issues. "Over time, most judges will probably develop at least some facility for understanding science beyond the typical juror's level of understanding." B. Black, F. Ayala & C. Saffran-Brinks, supra, 72 Tex. L. Rev. 788. On the other hand, "[t]aking the time required to educate jurors and to present them with similarly detailed information could easily overwhelm the other issues in a case." Id.

Given this background, we conclude that a gatekeeping role for trial judges in relation to scientific evidence is appropriate. Although the extent to which juries give scientific evidence undue deference is uncertain, the potential risk can be greatly reduced simply by allowing the judge, as the participant in the judicial process with both the greater access and ability to gather relevant information, to exclude wholly invalid scientific testimony altogether. Moreover, a trial judge who does admit scientific evidence will be in a better position, by virtue of the knowledge gained during the preliminary assessment, to conduct the trial and instruct the jury in such a way as to minimize the risk that jurors will give that evidence undue deference.[18]

[18] We emphasize that we do not assume that jurors lack the capacity to analyze and understand complex scientific evidence. Indeed, once such evidence is admitted, we ask jurors to do just that. Nonetheless, we conclude that it is incumbent upon trial judges to minimize, to the extent possible, the confusion and prejudice that scientific evidence may generate. Moreover, the very fact that proponents of scientific evidence will already have had to organize their evidence in a clear, comprehensible manner in order to pass the threshold validity assessment will, it is hoped, lead to clear, compre-

b

In addition, we believe it is proper for trial judges to serve as gatekeepers for scientific evidence because a relevance standard of admissibility inherently involves an assessment of the validity of the proffered evidence. More specifically, if scientific evidence has no grounding in scientific fact, but instead is based on conjecture and speculation, it cannot in any meaningful way be relevant to resolving a disputed issue.

McCormick himself, although a proponent of the relevance standard for scientific evidence, initially recognized this fact. In the first edition of his treatise on evidence, McCormick rejected the *Frye* test in favor of a relevancy standard, in much the same manner as that test is rejected in the fourth edition of his treatise. See C. McCormick, Evidence (1954) § 170, pp. 363–64. He went on to conclude, however, that such a standard would entail "deflat[ing] the requirement [of general acceptance] to the normal standard which simply demands that the theory or device be *accepted by a substantial body of scientific opinion* . . . ." (Emphasis added.) Id., § 174, pp. 371–72. McCormick thus implicitly acknowledged that some indication of scientific validity—accomplished here by a showing of "substantial" acceptance—is necessary for scientific evidence even to be relevant. It is true that the previous passage was removed from subsequent editions of McCormick's treatise. See, e.g., C. McCormick, Evidence (2d Ed. 1972) § 207, pp. 506–507. Nonetheless, we believe that McCormick's original understanding was correct. See also P. Giannelli, supra, 80 Colum. L. Rev. 1233–34.

2

Having concluded that Connecticut judges should exercise a gatekeeper function with regard to scientific

hensible presentations to the jury as well, thus aiding jurors in their ultimate assessments.

evidence, we now briefly explain our conclusion that the *Frye* "general acceptance" standard is not adequate for this role. We note that even before the decision in *Daubert*, the *Frye* rule was widely criticized.[10] "[S]cholars have criticized the *Frye* approach for being unduly conservative and for abandoning the fundamental evidentiary [principle] of . . . probity." "Developments in the Law—Confronting the New Challenges of Scientific Evidence" ("Developments in the Law"), 108 Harv. L. Rev. 1481, 1486 (1995). These critics observe that scientific pioneers and dissenters are occasionally right. " 'When photography was first introduced, it was seriously questioned whether pictures thus created could properly be introduced into evidence, but this method of proof, as well as by means of x-rays and the microscope, is now admitted without question.' [*People* v. *Jennings*, 252 Ill. 534, 548, 96 N.E. 1077 (1911)]. As with most scientific phenomena, the passage of time can serve . . . to demonstrate the reliability and acceptance of a once speculative and unproved premise." *State* v. *Bullard*, 312 N.C. 129, 146, 322 S.E.2d 370 (1984). Excluding scientific views simply because they are not "generally accepted," without *any* further consideration of their validity, thus contravenes "the liberal nature . . . of modern evidentiary law." R. Friedman, supra, 34 Jurimetrics J. 133–34.

We are persuaded by these criticisms of the *Frye* test. We conclude that an admissibility test for scientific evidence premised *solely* on its "general acceptance" is conceptually flawed and therefore must be rejected. In doing so, we follow in the footsteps of the many

[10] See generally 1 C. McCormick, Evidence (4th Ed. 1992) § 203, pp. 871–73 ("Especially in the last two decades . . . the *Frye* standard has been subjected to critical analysis, limitation, modification, and finally, outright rejection. . . . A drumbeat of criticism of the *Frye* test provides the background music to the movement away from the general acceptance test." [Internal quotation marks omitted.]).

jurisdictions that, both before[20] and after[21] the *Daubert* decision, have chosen to reject the *Frye* standard as an absolute prerequisite to the admissibility of scientific evidence.[22] See, e.g., *State* v. *Pennington*, 327 N.C. 89,

[20] Even before *Daubert*, several courts rejected the *Frye* standard as not embodying an adequate gatekeeper function. Several federal courts expressly rejected the rigid "nose-counting" of *Frye* and instead based admissibility decisions on the "helpfulness" to the fact finder of proffered scientific evidence. *DeLuca* v. *Merrell Dow Pharmaceuticals, Inc.*, 911 F.2d 941, 951, 955 (3d Cir. 1990); see also *United States* v. *Jakobetz*, 955 F.2d 786 (2d Cir.), cert. denied, 506 U.S. 834, 113 S. Ct. 104, 121 L. Ed. 2d 63 (1992); *Clinchfield R. Co.* v. *Lynch*, 784 F.2d 545 (4th Cir. 1986); *United States* v. *Downing*, 753 F.2d 1224 (3d Cir. 1985); *United States* v. *Mustafa*, 22 M.J. 165 (C.M.A.), cert. denied, 479 U.S. 953, 107 S. Ct. 444, 93 L. Ed. 2d 392 (1986). Many state courts also followed this approach. *See, e.g., Barmeyer* v. *Montana Power Co.*, 202 Mont. 185, 191–92, 657 P.2d 594 (1983); *State* v. *Brown*, 297 Or. 404, 409, 416–17, 687 P.2d 751 (1984); *State* v. *Dery*, 545 A.2d 1014, 1017 (R.I. 1988).

In total, twenty states had already rejected *Frye* and had adopted a "helpfulness" or "relevance" test for admissibility of scientific evidence by the time *Daubert* was decided in 1993. See J. Meaney, "From *Frye* to *Daubert*: Is a Pattern Unfolding?" 35 Jurimetrics J. 191, 194–98 (1995) (compiling state judicial responses to *Daubert* on state-by-state basis).

[21] The movement among state courts away from *Frye* and toward the *Daubert* approach has continued since the *Daubert* decision. See footnote 9; see also *Harrison* v. *State*, 644 N.E.2d 1243, 1252 (Ind. 1995); *State* v. *Hofer*, 512 N.W.2d 482, 484 (S.D. 1994); *State* v. *Brooks*, 162 Vt. 26, 30, 643 A.2d 226 (1994).

[22] We recognize that, to date, most of the states that have rejected *Frye* and have adopted a *Daubert* approach; see, e.g., footnotes 20 and 21; have state evidentiary codes that contain an analogue to rule 702 of the Federal Rules of Evidence, which Connecticut lacks, and that this fact often plays some role in their decisions. But see *Lattarulo* v. *State*, 261 Ga. 124, 126, 401 S.E.2d 516 (1991) (even though Georgia lacks rule 702 analogue, test for admissibility of scientific evidence is "whether the procedure or technique 'has reached a scientific stage of verifiable certainty' "); see generally J. Meaney, "From *Frye* to *Daubert*: Is a Pattern Unfolding?" 35 Jurimetrics J. 191, 199 (1995).

We also recognize that with the exception of Georgia and, now, Connecticut, every other state without a rule 702 analogue—Alabama, California, Illinois, Maryland and New York—currently operates under a *Frye* standard. We note, however, that three of these states—Alabama, Illinois and Maryland—simply have not addressed the issue. *See, e.g., People* v. *Miller*, 173 Ill. 2d 167, 670 N.E.2d 721, 731 n.3 (1996) (explicitly noting that *Daubert* issue has not yet been presented to court). Thus, only two of the states without a rule 702 analogue—New York and California—have expressly

98, 393 S.E.2d 847 (1990) (admissibility of scientific evidence should be based on "the reliability of the scientific method rather than its popularity within a scientific community").

3

We now turn to our reasons for concluding that the *Daubert* approach to the admissibility of scientific evidence is the proper approach for judges to follow in performing their gatekeeper role. In doing so, we are mindful of the fact that almost every other jurisdiction that has rejected *Frye* has also, either explicitly or effectively, adopted the *Daubert* multifactor "validity" approach to admissibility.[23] We agree with, and join in, this movement.

Our reasons for adopting *Daubert* are based upon our understanding of that case. By its own terms, the opinion of the United States Supreme Court in *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 579, sets forth a conceptual *approach* to the admissibility of scientific evidence, and not a functional *test* therefor. As discussed previously, the essential holding of the Supreme Court is the general principle that, as a threshold matter, and subject still to the rules of evidence generally, scientific evidence should be admitted in court only upon some showing of its scientific validity. Id., 592–93; see generally part I A of this opinion.

rejected *Daubert* and have retained *Frye*. See *People* v. *Leahy*, 8 Cal. 4th 587, 595, 882 P.2d 321, 34 Cal. Rptr. 2d 663 (1994); *People* v. *Wesley*, 83 N.Y.2d 417, 423, 633 N.E.2d 451, 611 N.Y.S.2d 97 (1994). Moreover, although California ostensibly still follows *Frye*, the California Supreme Court has implicitly recognized the imprudence of the strict "general acceptance" standard by holding that " 'general acceptance' does not require unanimity, a consensus of opinion, or even majority support by the scientific community." *People* v. *Leahy*, supra, 601.

In any event, we conclude that our reasons for rejecting *Frye* and adopting a *Daubert* approach, as explained in this opinion, are valid independent of the existence of a codified rule 702 analogue.

[23] See, e.g., footnotes 20 and 21.

Although the court provides "general observations" as to some factors that might be relevant to this determination, it explicitly states that "[m]any factors will bear on the inquiry, *and we do not presume to set out a definitive checklist or test.*" (Emphasis added.) *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 593. "*Daubert* does not purport to answer all questions or to resolve all problems associated with scientific testimony." L. Loevinger, "Science as Evidence," 35 Jurimetrics J. 153, 179 (1995); see also "Developments in the Law," supra, 108 Harv. L. Rev. 1513 (*Daubert* "offer[s] little practical guidance").

Critics of *Daubert* emphasize this indefiniteness. Chief Justice Rehnquist, in his concurring and dissenting opinion, for example, although agreeing that "Rule 702 confides to the judge some gatekeeping responsibility"; *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 600; commented that "[q]uestions arise simply from reading [the 'general observations'] part of the Court's opinion, and countless more questions will surely arise when hundreds of district judges try to apply its teaching to particular offers of expert testimony." Id.; see also R. Dreyfuss, supra, 73 Tex. L. Rev. 1780 (*Daubert*'s "reach is indeterminate, and the few specific guidelines announced in the opinion do not begin to cover the issues that judges who follow it must consider").

We view *Daubert*'s indefiniteness not as a flaw, but as a necessity. The term "scientific evidence" covers a large variety of subjects. The Federal Judicial Center, for example, included in its Reference Manual on Scientific Evidence essays on the broad topics of epidemiology, toxicology, survey research, DNA evidence, multiple regression, and estimation of economic losses in damages awards. See Reference Manual on Scientific Evidence, J. Moore, Federal Practice (1995). In addition to those subjects, courts have also treated as scientific

evidence testimony on subjects ranging from the causation of a plaintiff's cataracts; *O'Conner* v. *Commonwealth Edison Co.*, 13 F.3d 1090 (7th Cir. 1994); to an analysis of bloodstain patterns at a crime scene; *State* v. *Goode*, 341 N.C. 513, 461 S.E.2d 631 (1995); to, of course, polygraph evidence; *State* v. *Beard*, 194 W. Va. 740, 461 S.E.2d 486 (1995); and beyond.

Accordingly, we conclude that it is impossible to formulate a specific, clearly defined test that provides judges with a precise, complete list of factors to consider in evaluating the entire class of scientific evidence. No purely mechanical test based on a finite number of set considerations can, in and of itself, truly guide judges with regard to the admissibility of all of the varied and eclectic types of scientific evidence. Indeed, "[e]ach factor may shed some light on the scientific merits of the evidence, but none illuminates much of the total picture. Without a conceptual framework, using [mechanical] multiple-factor tests to evaluate science is like trying to light up a ball park with a few misaimed spotlights." B. Black, F. Ayala & C. Saffran-Brinks, supra, 72 Tex. L. Rev. 735.

It is therefore no surprise that courts that do apply either *Frye* or *Daubert* in a purely mechanical manner—simply looking at whether certain, specified factors are met—do not reach consistent results across jurisdictions regarding the admissibility of particular types of scientific evidence. By reading the individual factors narrowly or broadly, courts can skew the analysis toward the end they desire.[24] As a result, "courts purporting to apply the same . . . standard to essen-

[24] For example, commentators have argued that, depending on the desired outcome, courts applying *Frye* have "differed on the issues of *who* constitutes the relevant community for acceptance, as well as *what* precisely that community must have approved in a given case." (Emphasis in original.) "Developments in the Law," supra, 108 Harv. L. Rev. 1486; see also P. Giannelli, supra, 80 Colum. L. Rev. 1208–15.

tially the same problem frequently reach conflicting conclusions." "Developments in the Law," supra, 108 Harv. L. Rev. 1494. Thus, for example, courts ostensibly applying *Frye* have both admitted and excluded voiceprint evidence,[25] as have courts ostensibly applying multifactor validity checklists. See generally B. Black, F. Ayala & C. Saffran-Brinks, supra, 72 Tex. L. Rev. 735–39; "Developments in the Law," supra, 1494–98.

Indeed, because a generic, mechanical standard is often inapposite to an understanding of the validity of a particular type of scientific evidence, such a specific standard frequently deflates into no standard at all. This is because "[s]uperficially clear doctrinal standards that are in fact indeterminate nearly to the point of uselessness serve only to obstruct the rules that govern the system." "Developments in the Law," supra, 108 Harv. L. Rev. 1497. That is, mechanical factor tests emphasize specific considerations that are often irrelevant or unduly narrow while simultaneously obscuring the underlying principles upon which a court *should* be focusing. As a result, such tests have "little analytical value [and] serve primarily as labels to justify a court's instinctive reaction." B. Black, F. Ayala & C. Saffran-Brinks, supra, 72 Tex. L. Rev. 735. Thus, the reality under most mechanical tests for the admissibility of scientific evidence is that, beneath the illusion of a rigid standard, the court in fact has essentially unfettered discretion.

We conclude that a test embodying a general, overarching approach to the threshold admissibility of scientific evidence is required. Although such a standard is

[25] "Voiceprints are graphic depictions of sound produced by a device called a sound spectrograph. Their forensic use is based on the premise that each person's voice produces a unique 'picture.' Voiceprints typically appear in court when there is a recording of an incriminating telephone call and the identity of the caller is at issue." B. Black, F. Ayala & C. Saffran-Brinks, supra, 72 Tex. L. Rev. 735.

more vague on its surface, it will in fact discourage untrammeled discretion by giving trial courts a workable principle to follow. Moreover, we believe that *Daubert*'s focus on scientific validity properly directs trial judges to the core issue that they should address as gatekeepers of scientific evidence. For, as explained previously, scientific evidence is likely neither relevant nor helpful to the fact finder if it does not meet some minimum standard of validity.[25] See generally part I B 1 of this opinion.

C

We now examine, pursuant to our conception of the *Daubert* approach, the mechanics and scope of a *Daubert* assessment. Indeed, our reasons for adopting the *Daubert* approach at all are intertwined with, and dependent upon, our conception of how that approach should operate.

1

We begin by noting the distinction under the *Daubert* approach between the methodologies underlying an expert's scientific testimony and the expert opinion itself. As the court in *Daubert* noted, the focus of a validity assessment "must be solely on principles and methodology, not on the conclusions that they generate." *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 595. So long as the methodology underlying a scientific opinion has the requisite validity, the testimony derived from that methodology meets the *Daubert* threshold for admissibility, even if the judge

[25] We emphasize, however, as did the court in *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 595, that simply satisfying this minimum threshold standard does not automatically guarantee admission of scientific testimony. Such testimony, even if it satisfies *Daubert*, is still subject to the requirements imposed on *all* evidence by the rules of evidence generally. In particular, scientific testimony, like all testimony, can be excluded if its prejudicial impact outweighs its probative value. See part I A and D of this opinion.

disagrees with the ultimate opinion arising from that methodology, *and even if there are other methodologies that might lead to contrary conclusions.* Thus, a judge should admit scientific testimony when "there are good grounds for [the] expert's conclusion, even if the judge thinks that there are better grounds for some alternative conclusion . . . ." *In re Paoli R. Yard PCB Litigation*, 35 F.3d 717, 744 (3d Cir. 1994).

For example,[27] in *Cella* v. *United States*, 998 F.2d 418, 420 (7th Cir. 1993), the plaintiff claimed that his polymyositis—an inflammation of the muscles involving both the upper and lower extremities—was caused by certain events of physical and emotional trauma he suffered while working aboard a Navy vessel. The plaintiff presented the testimony of a single physician supporting his theory of liability, while the defendant presented several witnesses who testified that the cause of polymyositis is, in fact, unknown, and thus could not be attributed to the aforementioned traumas with any degree of certainty. Id., 421–22. After the court, in a bench trial, found in favor of the plaintiff, the defendant appealed, claiming, in part, that the testimony of the plaintiff's physician should not even have been admitted "in light of the testimony of the defendant's medical experts and the abundance of medical literature stating that the etiology of polymyositis is unknown." Id., 423.

After a thorough review of the bases upon which the plaintiff's physician had based his opinion, the court upheld the admission of his testimony. "Although [the plaintiff's physician's] conclusion differs from those of the defendant's medical experts, he has utilized an accepted methodology in reaching his conclusion—namely, analysis of medical literature and case study comparison with the individual characteristics of

[27] The examples cited throughout part I C 1 of the opinion are merely illustrative. We do not necessarily endorse the conclusions reached in these cases.

the patient's case to determine etiology." Id., 426. Thus, although there was little support in the literature for the physician's specific *conclusion* regarding the cause of the plaintiff's injury, the court found that he had employed a proper and thorough diagnostic *methodology*. Accordingly, it was not error to admit the physician's testimony, because " '[a]s long as the expert's methodology is well founded, the nature of the expert's conclusion is generally irrelevant, even if it is controversial or unique.'"[28] Id. Once the methodology underlying an expert conclusion has been sufficiently established, the mere fact that controversy, or even substantial controversy, surrounds that conclusion goes only to the weight, and not to the admissibility, of such testimony.[29]

Of course, even where a particular technique has been shown to satisfy *Daubert*, the proponent must also establish that the specific scientific testimony at issue is, in fact, *derived from* and based upon that methodology. The Supreme Court in *Daubert* referred to this concept as the "fit" requirement. *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 591; see part I A of this opinion. "[A]lthough some conclusions can be reasonably inferred from the methodology employed, others cannot." J. Kesan, supra, 84 Geo. L.J.

[28] We note that, although *Cella* v. *United States*, supra, 998 F.2d 418, nominally applied the *Frye* standard, the court's analysis is actually more consistent with the *Daubert* multifactor approach. See id., 424–27. Indeed, *Cella* demonstrates, yet again, that the label that courts apply when assessing the admissibility of scientific evidence is often completely divorced from the substance of the analysis that they undertake.

[29] While the distinction between methodologies and conclusions is important, it is nonetheless true that the two are closely linked. It is plain that a judge's doubts about an expert's conclusions are often based upon doubts regarding the expert's methodology. "When a judge disagrees with the conclusions of an expert, it will generally be because he or she thinks that there is a mistake at some step in the investigative or reasoning process of that expert. If the judge thinks that the conclusions of some other expert are correct, it will likely be because the judge thinks that the methodology and reasoning process of the other expert are superior to those of the first expert." *In re Paoli R. Yard PCB Litigation*, supra, 35 F.3d 746.

2022. "When an expert's conclusions are not commensurate with the underlying methodology, they may be properly excluded under *Daubert* because they do not rely on scientific knowledge and are thus unhelpful to the jury." Id.; see, e.g., *State* v. *Foret*, 628 So. 2d 1116, 1124–27 (La. 1993) (expert testimony that victim of alleged molestation had, in fact, been abused should have been excluded when testimony was based on psychological methodology designed and intended solely to assist in treatment, and not as diagnostic tool).

2

We now set forth some of the factors that various courts have considered in conducting a methodological analysis. We emphasize, however, that these factors are *not* exclusive. Some will not be relevant in particular cases; and some cases will call for considerations not discussed herein. "The factors a trial court will find helpful in determining whether the underlying theories and techniques of the proffered evidence are scientifically reliable will differ with each particular case." *E.I. du Pont de Nemours & Co.* v. *Robinson*, 923 S.W.2d 549, 557 (Tex. 1995); see also *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 593; *In re Paoli R. Yard PCB Litigation*, supra, 35 F.3d 742. Indeed, as discussed previously; see generally part I B 3 of this opinion; a mechanical list of mandatory factors would frustrate the entire concept underlying the *Daubert* approach.

Even under *Daubert*, courts should continue to consider whether a scientific principle has gained "general acceptance" in making admissibility determinations. Although "general acceptance" is no longer an absolute prerequisite to the admission of scientific evidence, it should, in fact, be an important factor in a trial judge's assessment. Indeed, "[w]e suspect that general acceptance in the relevant scientific community will continue

to be the significant, and often the only, issue." *Commonwealth v. Lannigan*, 419 Mass. 15, 26, 641 N.E.2d 1342 (1994). Thus, "[a]lthough *Frye* may no longer be *the* standard for admissibility, general acceptance remains a part of the analysis, and in many cases its presence may alone be sufficient to admit the evidence." (Emphasis in original.) "Standards and Procedures for Determining the Admissibility of Expert Evidence After *Daubert*," 157 F.R.D. 571, 574 (1995). That is, if a trial court determines that a scientific methodology *has* gained general acceptance, then the *Daubert* inquiry will generally end and the conclusions derived from that methodology will generally be admissible.[30] If a principle has *not* gained general acceptance, however, we emphasize that "a proponent of [the] scientific opinion . . . may [still] demonstrate the reliability or validity of the underlying scientific theory or process by some other means, that is, without establishing general acceptance." *Commonwealth v. Lannigan*, supra, 26; see also *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 588–89.

Several other factors may properly play a role in a court's assessment of the validity of a scientific methodology. The remaining factors listed in *Daubert*—whether that methodology has been tested and

[30] We also note that some scientific principles have become so well established that an explicit *Daubert* analysis is not necessary for admission of evidence thereunder. By this, we do not mean to reestablish the *Frye* general acceptance test. We do acknowledge, however, as did the Supreme Court in *Daubert*, that a very few scientific principles "are so firmly established as to have attained the status of scientific law, such as the laws of thermodynamics, [and that such principles] properly are subject to judicial notice . . . ." *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 592 n.11. Evidence derived from such principles would clearly withstand a *Daubert* analysis, and thus may be admitted simply on a showing of relevance. For example, the Supreme Court of Montana recently noted that a *Daubert* analysis would not be necessary for ordinary fingerprint identification evidence to be admissible. *State* v. *Cline*, Mont. , 909 P.2d 1171, 1177 (1996). Of course, as with any other evidence, the weight that the fact finder should accord to such evidence may still be contested. Compare footnote 31.

subjected to peer review, and the known or potential rate of error—are of course important. See *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 592–94. Moreover, the prestige and background of the expert witness supporting the evidence can play a role in determining whether a novel technique employed by that individual is likely to have any scientific merit. *State* v. *Goode*, supra, 341 N.C. 527–28; *State* v. *Brown*, 297 Or. 404, 417, 687 P.2d 751 (1984); M. Gottesman, "Admissibility of Expert Testimony After *Daubert*: The 'Prestige' Factor," 43 Emory L.J. 867, 878 (1994). The extent to which the scientific technique in question relies on subjective interpretations and judgments by the testifying expert, rather than on objectively verifiable criteria, can also be a factor. *State* v. *Brown*, supra, 417; *E.I. du Pont de Nemours & Co.* v. *Robinson*, supra, 923 S.W.2d 557; "Developments in the Law," supra, 108 Harv. L. Rev. 1498. In the same vein, courts have looked at whether a testifying expert can present and explain the data and methodology underlying his or her scientific testimony in such a manner that the fact finder can reasonably and realistically draw its own conclusions therefrom. *State* v. *Goode*, supra, 527–28; "Developments in the Law," supra, 1502; see also *State* v. *Hasan*, supra, 205 Conn. 491. Several courts have also considered whether the scientific technique underlying the proffered expert testimony was developed and implemented solely to develop evidence for in-court use, or whether the technique has been developed or used for extrajudicial purposes. *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, 43 F.3d 1311, 1317 (9th Cir. 1995) (applying Supreme Court *Daubert* opinion on remand of case); *State* v. *Goode*, supra, 527–28; *State* v. *Brown*, supra, 417; *E.I. du Pont de Nemours & Co.* v. *Robinson*, supra, 557.

We appreciate that many of these factors lack precision, but this indefiniteness is unavoidable. The actual

operation of each factor, as is the determination of which factors should be considered at all, depends greatly on the specific context of each case in which each particular *Daubert* analysis is conducted. So long as trial judges remain focused on the underlying purpose behind the *Daubert* analysis—to establish whether a scientific methodology has sufficient validity to be helpful to the fact finder—we are confident that the previously mentioned uncertainties are not so overwhelming as to render *Daubert* functionally inoperative. Cf. R. Friedman, supra, 34 Jurimetrics J. 141 (ambiguities in *Daubert* factors "will probably be genuinely troublesome only if, contrary to the [Supreme] Court's stated intention, lower courts treat the criteria as checklist items, each of which must be satisfied for a proposition to be deemed scientific, rather than merely as factors to be weighed, along with others, into an overall balance").

3

We now turn to the threshold burden that a proponent of scientific testimony bears to establish that the testimony is admissible. "Once the party opposing the evidence objects, the proponent bears the burden of demonstrating its admissibility." *E.I. du Pont de Nemours & Co.* v. *Robinson*, supra, 923 S.W.2d 557.

In addressing the showing that a proponent of scientific evidence must make, we are largely guided by the fundamental tenets of the law of evidence regarding admissibility. "Evidence is admissible when it tends to establish a fact in issue or to corroborate other direct evidence in the case." (Internal quotation marks omitted.) *State* v. *McClendon*, 199 Conn. 5, 8, 505 A.2d 685 (1986). "Evidence is not rendered inadmissible because it is not conclusive. All that is required is that evidence *tend* to support a relevant fact even to a slight degree, so long as it is not prejudicial or merely cumulative."

(Emphasis in original.) C. Tait & J. LaPlante, Connecticut Evidence (2d Ed. 1988) § 8.1.1, p. 226. Moreover, even evidence "susceptible to different interpretations" is admissible; *State* v. *Gray*, 221 Conn. 713, 725, 607 A.2d 391, cert. denied, 506 U.S. 872, 113 S. Ct. 207, 121 L. Ed. 2d 148 (1992); " '[s]o long as the evidence may reasonably be construed in such a manner that it would be relevant . . . .' " Id.

These concepts are as applicable to scientific testimony as to other types of evidence. Thus, questions about the methodological validity of proffered scientific testimony will generally go to the *weight* of such evidence, not to its admissibility. Courts should exclude scientific evidence, however, when such concerns render the technique, and the resulting evidence, incapable of assisting the fact finder in a sufficiently meaningful way.[31] Moreover, in light of the traditional policy regard-

[31] Once the validity of a scientific principle has been satisfactorily established, any remaining questions regarding the manner in which that technique was *applied* in a particular case is generally an issue of fact that goes to weight, and not admissibility. *See*, e.g., *United States* v. *Porter*, 618 A.2d 629, 636 (D.C. App. 1992) ("any failure by the scientists to adhere to the appropriate procedure is, of course, a proper subject of inquiry," but does not bar admission of evidence); *Taylor* v. *State*, supra, 889 P.2d 330 n.46 ("allegations of error in the testing process affect the weight of scientific . . . evidence but not its admissibility"). Of course, even where questions about scientific evidence arise from concerns regarding application of a methodology, rather than the validity of the methodology itself, such evidence may still be excluded for failure to satisfy other of the rules of evidence.

Moreover, application of a methodology that is valid in the abstract can be so flawed that, in essence, a different, invalid methodology is being applied. Thus, although "[n]ot every error in the application of a particular methodology should warrant exclusion [a]n alleged error in the application of a reliable methodology should provide the basis for exclusion of the opinion [when] that error negates the basis for the reliability of the principle itself." *United States* v. *Martinez*, 3 F.3d 1191, 1198 (8th Cir. 1993).

For example, in *In re Paoli R. Yard PCB Litigation*, supra, 35 F.3d 717, several plaintiffs claimed that the defendant's use of polychlorinated biphenyl (PCB) in its railcar maintenance facility had caused various physical ailments. One witness for the plaintiffs was a physician who reviewed the medical history of all of the plaintiffs, but only personally examined two of

ing the admission of relevant evidence, "[a] judge frequently should find an expert's methodology helpful [and thus admissible] even when the judge thinks that the expert's technique has flaws sufficient to render the [expert's] conclusions inaccurate. He or she will often still believe that hearing the expert's testimony and assessing its flaws was an important part of assessing what conclusion was correct and may certainly still believe that a jury attempting to reach an accurate result should consider the evidence." *In re Paoli R. Yard PCB Litigation*, supra, 35 F.3d 744–45.

A trial judge should therefore deem scientific evidence inadmissible only when the methodology underlying such evidence is sufficiently invalid to render the evidence incapable of helping the fact finder determine a fact in dispute. We adopt the *Daubert* approach, however, specifically because we conclude that a sufficient showing of validity *is* necessary for scientific evidence to be helpful. See part I B 1 of this opinion. The interplay between these principles—a general policy in favor of admission of helpful evidence, and a specific policy of

them. Id., 764. After a thorough review of the physician's diagnostic technique, the Court of Appeals concluded that her basic methodology was valid. Id., 764–65. The court found, however, that this technique could not be properly applied at all in those cases where the physician did not personally examine a particular plaintiff, or with regard to particular symptoms of the plaintiffs she did examine when her inquiry into those symptoms was not sufficiently broad. Id., 764–70. Accordingly, the Court of Appeals concluded that the District Court had properly excluded much of the physician's testimony, even though the underlying methodology was valid, because the application of the methodology with regard to many of the plaintiffs was sufficiently flawed as to eliminate completely its reliability. Id.

It is important to note, however, the Court of Appeals' conclusion that, in those instances where the physician's inquiry into a patient's condition *had been* sufficient, it was an abuse of discretion for the trial court to exclude her testimony. Id., 765–67. Even though the physician was of "dubious expertise"; id., 765; such concerns did not render her underlying methodology per se invalid, and once that validity had been established, concerns about her qualifications went to her credibility, not to the admissibility of her testimony.

NOTE: These pages (241 Conn. 89 and 90) are in replacement of the same numbered pages that appeared in the Connecticut Law Journal of 20 May 1997.

requiring a showing of a certain level of validity before scientific testimony can properly be presented to a fact finder—cannot be resolved by an absolute statement or rule. Instead, a case-by-case analysis will be necessary.

D

It is important to remember that *Daubert* only provides a *threshold* inquiry into the admissibility of scientific evidence. Even evidence that has met the *Daubert* inquiry into its methodological validity, and thus has been shown to have some probative value, may be excluded for failure to satisfy other evidentiary rules. In particular, scientific evidence, like all evidence, is properly excluded if its prejudicial impact outweighs its probative value, even if it is otherwise admissible. See, e.g., *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 595; *State* v. *Figueroa*, 235 Conn. 145, 162, 665 A.2d 63 (1995); C. Tait & J. LaPlante, supra, § 8.1.3, p. 227.

E

Finally, we address the concern that, by requiring trial courts to conduct a *Daubert* validity assessment, we are improperly requiring them to become amateur scientists. According to some critics, a significant problem with the *Daubert* approach is that "we sorely underestimate the complexity of many scientific controversies, particularly those involving complex quantitative analysis, when we presume that nonscientist judges can master the technical issues to the point that they should feel comfortable deciding what is or is not good science in a particular case. Scientists who have spent the greater portions of their professional lives wrestling with the complexities and mysteries of their disciplines must be amazed at the law's hubris in thinking that nonscientist judges can 'get up to speed' on a scientific dispute and ultimately decide who has

the better of the argument."[32] P. Milich, "Controversial Science in the Courtroom: *Daubert* and the Law's Hubris," 43 Emory L.J. 913, 919 (1994); see also *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 600–601 (Rehnquist, C. J., concurring in part and dissenting in part); J. Kesan, supra, 84 Geo. L.J. 2000.[33]

We conclude that this concern is unfounded. Under *Daubert*, trial judges are not required to make a determination of the ultimate scientific validity of any scientific propositions. Instead, they need only make a much more limited inquiry: whether sufficient indicia of legitimacy exist to support the conclusion that evidence derived from the principle may be profitably considered by a fact finder at trial. It is true that answering even this question may require "a deeper and more detailed preliminary review of scientific claims than most courts have heretofore undertaken." B. Black, F. Ayala & C. Saffran-Brinks, supra, 72 Tex. L. Rev. 721. Nonetheless, we do not expect this process to burden our courts unduly. "Though the details of science may be remote from common experience, nonscientists can under-

[32] Even under *Frye*, however, "general acceptance," and thus scientific validity, was often determined by reference to acceptance among judges, not scientists. "Contrary to the assertion . . . that the *Frye* test places the responsibility of determining scientific validity upon scientists, in practice too many courts reference reported case law to determine what is generally accepted in the scientific community." *State* v. *Alberico*, supra, 861 P.2d 203.

[33] "Indeed, this concern motivated the Court of Appeals for the Ninth Circuit, on remand in *Daubert*, to offer the following comment regarding the new *Daubert* standard: '[T]hough we are largely untrained in science and certainly no match for any of the witnesses whose testimony we are reviewing, it is our responsibility to determine whether those experts' proposed testimony amounts to 'scientific knowledge,' constitutes 'good science,' and was 'derived by the scientific method.' . . . Our responsibility, then . . . is to resolve disputes among respected, well-credentialed scientists about matters squarely within their expertise, in areas where there is no scientific consensus as to what is and what is not 'good science,' and occasionally to reject such expert testimony because it was not 'derived by the scientific method.' Mindful of our position in the hierarchy of the federal judiciary, we take a deep breath and proceed with this heady task." *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 43 F.3d 1316.

stand the fundamental characteristics that separate valid science from pale imitations." Id., 720; see also *E.I. du Pont de Nemours & Co.* v. *Robinson*, supra, 923 S.W.2d 557–58.

Moreover, to the extent that our adoption of *Daubert* does "[signal] that the time has come for courts and lawyers to learn the basic principles of science"; L. Loevinger, supra, 35 Jurimetrics J. 179; we see this as an unavoidable necessity. As science and technology have advanced and become increasingly prevalent in our society, the number of cases, both civil and criminal, in which scientific testimony plays a role has also grown. See, e.g., id., 172 n.110. This number undoubtedly will continue to grow in the future. When such cases, with their attendant evidentiary issues, arise, it is indisputable that "[j]udges will . . . face difficult issues that are beyond their background and training. But they should not respond by evading their responsibility to reach a carefully reasoned decision or by using superficial labels 'to justify [their] instinctive reaction.' Instead, judges should try to educate themselves about the proposed area of expertise . . . ." "Developments in the Law," supra, 108 Harv. L. Rev. 1517. Only by being knowledgeable, in at least a basic way, about the issues surrounding the scientific evidence before them, can judges discharge their duties properly. Accordingly, *Daubert*, at its most fundamental level, merely directs "trial judges consciously [to] do what is in reality a basic task of a trial judge—ensure the reliability and relevance of evidence without causing confusion, prejudice or mistake." "Standards and Procedures for Determining the Admissibility of Expert Evidence After *Daubert*," supra, 157 F.R.D. 577.

II

Admissibility of Polygraph Evidence

We now turn to the defendant's claim that Connecticut should abandon its traditional per se rule against

the admission of polygraph evidence at trial. "This court has repeatedly held that neither the results of a polygraph test nor the willingness of a witness to take such a test is admissible in Connecticut courts."[34] *State* v. *Esposito*, 235 Conn. 802, 831, 670 A.2d 301 (1996). The defendant argues that this position is inconsistent with *Daubert*.

Without deciding, we will assume, for the purposes of this opinion, that polygraph evidence satisfies the admissibility threshold established by *Daubert*. After reviewing the case law and the current, extensive literature on the polygraph test, however, we are convinced that the prejudicial impact of polygraph evidence greatly exceeds its probative value.[35] Accordingly, we

[34] Most courts agree that evidence of both the results of a polygraph test and of a witness' willingness to take a polygraph test implicate the same concerns and should be treated alike. See *State* v. *Webber*, 260 Kan. 263, 918 P.2d 609, 620 (1996). Admittedly, even if the polygraph test itself lacks evidentiary value, an individual's willingness to undergo such a test might have some probative value so long as the subject believed in the test's efficacy. Such willingness may also indicate, however, that the witness knows about the test's weaknesses or is simply willing to take his or her chances. We conclude that a witness' willingness to take a test of questionable validity is itself of limited probative value. Accordingly, all references in this opinion to "polygraph evidence" refer to evidence of both the substantive results of polygraph tests and of a witness' willingness to take such tests.

[35] Indeed, concerns regarding the polygraph's prejudicial impact have historically been the primary basis upon which this court has excluded polygraph evidence. It is true that we have mentioned the *Frye* test in excluding polygraph evidence. See *State* v. *Huson*, supra, 205 Conn. 489; *State* v. *Miller*, 202 Conn. 463, 484, 522 A.2d 453 (1987). A review of our cases excluding polygraph evidence, however, reveals that the polygraph's unreliability and prejudicial impact, and not reliance on the *Frye* standard, were the principal motivating factors behind the decisions. See, e.g., *State* v. *Mitchell*, 169 Conn. 161, 170, 362 A.2d 808 (1975) (polygraph evidence inadmissible because unreliable, and because "[c]redibility as an issue is committed to the sole determination of the trier of fact"); see also *State* v. *Esposito*, supra, 235 Conn. 831 (polygraph evidence inadmissible because of "[t]he questionable accuracy of polygraph tests"); *State* v. *Dantz*, 223 Conn. 207, 238, 613 A.2d 224 (1992) (polygraph evidence inadmissible "[d]ue to the questionable accuracy of the results of polygraph examinations"); *State* v. *Plourde*, 206 Conn. 455, 471, 545 A.2d 1071 (1988), cert. denied, 488 U.S. 1034, 109 S. Ct. 847, 102 L. Ed. 2d 979 (1989) (polygraph evidence has "minimal probative

see no reason to abandon our well established rule of exclusion, and we conclude that polygraph evidence should remain per se inadmissible in all trial court proceedings in which the rules of evidence apply,[36] and for all trial purposes,[37] in Connecticut courts.

A

We first explain our methodology in assessing, in the absence of an evidentiary hearing before the trial court, the likely probative value of polygraph evidence. In conducting such an assessment, an appellate court "may take judicial notice of the existence of a body of scientific literature." *Browning-Ferris Industries of South Jersey, Inc.* v. *Muszynski*, 899 F.2d 151, 161 (2d Cir. 1990). To ensure consistency in the approach to scientific evidence, a court should examine the foundation evidence received, if any; the scientific literature; and other courts' analyses. *State* v. *Streich*, 163 Vt. 331,

value"); *State* v. *Miller*, supra, 486 (polygraph evidence of " 'questionable accuracy' "); *State* v. *Saia*, 172 Conn. 37, 42, 372 A.2d 144 (1976) (polygraph evidence not accepted as reliable and accurate means of ascertaining truth).

[36] Although most of the literature and case law address polygraph evidence admissibility in criminal cases, we note the finding by the United States Office of Technology Assessment, uncontroverted in any literature, that "meaningful scientific evidence of polygraph validity [exists] only in the area of *criminal* investigations." (Emphasis added.) United States Congress, Office of Technology Assessment, "Scientific Validity of Polygraph Testing: A Review and Evaluation—A Technical Memorandum," OTA-TM-H-15 (1983), reprinted in 12 Polygraph 198, 200 (1983). In light of this fact, and given our ultimate determination that polygraph evidence is of limited probative value even in the criminal context, we conclude that polygraph evidence should be excluded from civil as well as criminal trials. Cf. *State* v. *Brown*, supra, 297 Or. 445 (polygraph evidence inadmissible in any civil or criminal trial or any other proceeding subject to rules of evidence).

[37] Some jurisdictions that bar the admission of polygraph evidence for the substantive truth of the matter asserted do allow it to corroborate or impeach a witness' testimony. See part II C of this opinion. We see no reason for this distinction. All of the valid criticisms of polygraph evidence; see part II B of this opinion; are equally applicable in either context. We therefore agree with the majority of jurisdictions that maintain a per se rule against the admissibility of polygraph evidence in any circumstance. See part II C of this opinion.

343, 658 A.2d 38 (1995). Indeed, even when, as in this case, there has been no evidence introduced at the trial level, an appellate court may properly "analy[ze] . . . the issues . . . based [only] on consideration of the information gleaned from prior reported cases and published literature on the subject matter." *State* v. *Foret*, supra, 628 So. 2d 1131. In the past, this court has taken notice of empirical, extralegal materials in determining that, as a matter of law, certain scientific evidence was, in the form in which it was offered, inadmissible at trial. See *State* v. *Skipper*, 228 Conn. 610, 622–23, 637 A.2d 1101 (1994) (literature search revealed fact, not elicited at trial, that DNA test for determining paternity relied on mathematical formula that assumed prior probability of paternity inconsistent with presumption of innocence in criminal case); cf. *State* v. *Sivri*, supra, 231 Conn. 158–61 (directing trial court to take notice of new scientific report, issued while case on appeal, in making determination of validity and admissibility of DNA population frequency calculations).

B

With this background in mind, we turn now to an assessment of the threshold validity, probative value, and prejudicial impact of polygraph evidence. In order to do so, it is necessary to understand some of the mechanics and theory behind the modern polygraph test.

1

Modern polygraph theory rests on two assumptions: (1) there is a regular relationship between deception and certain emotional states; and (2) there is a regular relationship between those emotional states and certain physiological changes in the body that can be measured and recorded. J. Tarantino, Strategic Use of Scientific Evidence (1988) § 6.01, p. 205. These physiological changes include fluctuations in heart rate and blood

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pressure, rate of breathing, and flow of electrical current through the body; and they are measured by a cardiosphygmograph, a pneumograph and a galvanometer, respectively. Id. These instruments, bundled together, form the basis of most modern polygraphs.

There is no question that a high quality polygraph is capable of accurately measuring the relevant physical characteristics. United States Congress, Office of Technology Assessment, "Scientific Validity of Polygraph Testing: A Review and Evaluation—A Technical Memorandum," OTA-TM-H-15 (1983) (OTA Memorandum), reprinted in 12 Polygraph 198, 201 (1983). Even polygraph advocates, however, acknowledge that "[n]o known physiological response or pattern of responses is unique to deception." D. Raskin, "The Polygraph in 1986: Scientific, Professional and Legal Issues Surrounding Application and Acceptance of Polygraph Evidence," 1986 Utah L. Rev. 29, 31 (1986). Indeed, "there is no reason to believe that lying produces distinctive physiological changes that characterize it and only it. . . . [T]here is no set of responses—physiological or otherwise—that humans omit only when lying or that they produce only when telling the truth . . . . No doubt when we tell a lie many of us experience an inner turmoil, but we experience similar turmoil when we are falsely accused of a crime, when we are anxious about having to defend ourselves against accusations, when we are questioned about sensitive topics—and, for that matter, when we are elated or otherwise emotionally stirred." (Citation omitted.) B. Kleinmuntz & J. Szucko, "On the Fallibility of Lie Detection," 17 Law & Society Rev. 85, 87 (1982). Thus, while a polygraph machine can accurately gauge a subject's *physiological* profile, it cannot, on its own, determine the nature of the underlying *psychological* profile. "The instrument cannot itself detect deception." OTA Memorandum,

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supra, reprinted in 12 Polygraph 196, statement of John Gibbons, Director of Office of Technology Assessment.[38]

The polygraph examiner, therefore, is responsible for transforming the output of a polygraph machine from physiological data into an assessment of truth or deception. See, e.g., P. Giannelli, "Forensic Science: Polygraph Evidence: Part I," 30 Crim. L. Bull. 262, 264 (1994). This mission actually involves two separate tasks. First, the examiner must design and implement a polygraph test in such a way that the physiological data produced is properly linked to a subject's deceptiveness, and not just to his nervousness or other unrelated emotional responses. Id., 263. Second, even if the data produced *is* linked to a subject's deception, the examiner must interpret the data, that is, grade the test, correctly. Id., 264.

The "control question test" is the polygraph method most commonly used in criminal cases to link physiological responses to deception.[39] See, e.g., C. Honts & M. Perry, "Polygraph Admissibility: Changes and Challenges," 16 Law & Hum. Behav. 357, 360 (1992). The control question test is based on the theory that fear of detection causes psychological stress.[40] Under that

[38] To paraphrase Judge Cardozo in *People* v. *Zackowitz*, 254 N.Y. 192, 195, 172 N.E. 466 (1930), a lie detector "records with graphic certainty the fluctuations of the pulse. There is no instrument yet invented that records with equal certainty the fluctuations of the mind."

[39] The record does not specify the type of polygraph examination administered in this case. Such facts as are in the record, however, suggest that it was either a control question test or a relevant-irrelevant test. See footnote 43. Because the former test is both the more likely and the more favorable to the defendant's claim, we will assume that a control question test was administered in this case.

[40] A number of theories other than fear of detection have been advanced to explain why a deceptive subject will undergo detectable physiological changes upon lying, including conditioned response theory, conflict theory, and threat-of-punishment theory. P. Giannelli, supra, 30 Crim. L. Bull. 263 n.12. The fear of detection theory is simply the most commonly accepted.

test, therefore, the "polygraph instrument is measuring the fear of detection *rather than deception per se*." (Emphasis added.) OTA Memorandum, supra, reprinted in 12 Polygraph 201.

In the control question test procedure, the polygrapher first conducts a pretest interview with the subject wherein the accuracy and reliability of the polygraph are emphasized.[11] This is done to aggravate the deceptive subject's fear of detection while calming the innocent subject, which is crucial given that the test's efficacy is based entirely on the subject's emotional state. All exam questions are then reviewed with the subject, in order to minimize the impact of surprise on the test results and to ensure that the subject understands the questions. The actual control question test consists of a sequence of ten to twelve questions, repeated several times. There are three categories of questions: neutral; relevant; and control. All questions are formulated by the polygrapher conducting the examination based on a review of the facts of the case.

A neutral question is entirely nonconfrontational and is designed to allow the polygrapher to get a baseline reading on the subject's physiological responses. A neutral question addresses a subject's name, age, address, or similar topic.

[11] During the pretest interview, a "stimulation test" is often administered. "In this test, the examiner instructs the subject to choose a particular number or name from a preselected series. The polygraph examiner does not know which number or name the subject chooses. The polygraph examiner then instructs the subject to respond 'no' every time he is asked whether he chose a specific number or name. The qualified examiner should be able to determine which response is deceptive by evaluating the physical responses detected by the polygraph. The examiner then confronts the subject with his findings, causing the subject to be 'convinced' that the polygraph examination is effective." J. Tarantino, supra, § 6.11, p. 218. Occasionally, however, the correct response is determined by trickery, not polygraphy. J. Rat & F. Inbau, Truth and Deception (2d Ed. 1977) pp. 42, 85 (stimulation test conducted using marked deck of cards).

A relevant question is accusatory and directed specifically at the subject under investigation. "For example, in an assault investigation, a relevant question might be: 'On May 1, 1986, did you strike Mr. Jones (the alleged victim) with any part of your body?' " J. Tarantino, supra, § 6.09, p. 215.

A control question concerns "an act of wrongdoing of the same general nature as the main incident under investigation," and is designed to be "one to which the subject, in all probability, will lie or to which his answer will be of dubious validity in his own mind." J. Rat & F. Inbau, Truth and Deception (2d Ed. 1977) p. 28. Control questions "cover many years in the prior life of the subject and are deliberately vague. Almost anyone would have difficulty answering them truthfully with a simple 'No.' " D. Raskin, supra, 1986 Utah L. Rev. 34. In an assault case, a control question might be: "Did you ever want to see anyone harmed?" J. Tarantino, supra, § 6.09, p. 215. Although few people honestly could deny these control questions categorically, they are "presented to the subject in a manner designed to lead him to believe that admissions would negatively influence the examiner's opinion and that strong reactions to those questions during the test would produce a deceptive result." D. Raskin, supra, 1986 Utah L. Rev. 34.[42]

The theory behind the control question test is that "the truthful person will respond more to the control questions than to the relevant questions because they represent a greater threat to that person. For the same reason the deceptive person will respond more to the relevant questions than to the control questions." P.

[42] In other words, the control question test process requires that the examiner, during the pretest interview, manipulate the subject into both (1) lying on the control questions, out of fear that the examiner will otherwise react negatively to the subject's prior antisocial conduct, and (2) fearing that this same deception will taint the entire exam.

Giannelli, supra, 30 Crim. L. Bull. 266–67. Thus, in order for the test to work properly, both truthful and deceptive examinees must have particular mind sets during the exam. "The innocent examinee [must fear] that the polygraph examiner will pick up his deception [on the control question] and incorrectly conclude that he is also being deceptive about the relevant question." J. Tarantino, supra, § 6.09, p. 216. As a result, the innocent subject's physiological responses to the control question, stemming from this fear, will be greater than those to the relevant question, which the subject can answer honestly. A guilty subject, however, will be more worried about having his crime and deception exposed by the relevant question than he is about any control question issues. Accordingly, his physiological responses—prompted by his fear of detection—will be greater with regard to the relevant question than to the control question.

Under the control question test, the absolute measure of the subject's physiological responses to each question is unimportant. For example, the mere fact that a subject has a strong response to a relevant question can simply be indicative of nervousness and does not, by itself, indicate deception. Instead, the polygrapher looks to the *relative* strength of the responses to the control and relevant questions in order to determine truth or deception.[11] The art of the polygrapher lies in

[11] This process is what separates the control question test from the relevant-irrelevant polygraph test. In the latter test, there are no control questions, only relevant and irrelevant questions. A subject whose responses to the relevant questions are greater than those to the irrelevant questions is considered deceptive. Although still practiced by some polygraphers today; P. Giannelli, supra, 30 Crim. L. Bull. 266; the relevant-irrelevant test is almost universally rejected in the literature. D. Raskin, supra, 1986 Utah L. Rev. 33 ("A variety of factors might cause individuals to react more strongly to questions about crimes of which they are accused than to innocuous questions. . . . There is no clear and systematic way to interpret the outcome of a relevant-irrelevant test, and the result is subject to a great deal of error."); C. Honts & M. Perry, supra, 16 Law & Hum. Behav. 360 ("Almost all of the scientists involved in detection of deception research reject the

composing control and relevant questions that elicit the appropriate relative responses from truthful and deceitful parties. See generally *United States* v. *Kwong*, 69 F.3d 663, 668 (2d Cir. 1995) (polygraph results excluded because examiner failed to formulate questions properly); J. McCall, supra, 1996 U. Ill. L. Rev. 378; D. Raskin, supra, 1986 Utah L. Rev. 47–49.

A control question exam ordinarily pairs relevant and control questions with some neutral questions interspersed. For example, a typical progression would be:

"1. (Neutral) Do you understand that I will ask only the questions we have discussed?

"2. (Pseudo-Relevant) Regarding whether you took that ring, do you intend to answer all of the questions truthfully?

"3. (Neutral) Do you live in the United States?

"4. (Control) During the first twenty-four years of your life, did you ever take something that did not belong to you?

"5. (Relevant) Did you take a ring from the Behavioral Sciences Building on July 1, 1985?

"6. (Neutral) Is your name Joanne?

"7. (Control) Between the ages of ten and twenty-four, did you ever do anything dishonest or illegal?

"8. (Relevant) Did you take that diamond ring from a desk in the Behavioral Sciences Building on July 1?

"9. (Neutral) Were you born in the month of February?

notion that the relevant-irrelevant test could be a useful discriminator of truth and deception . . . . [M]ost individuals will respond physiologically to the relevant questions regardless of their guilt." (Citations omitted.)).

"10. (Control) Before 1984 did you ever lie to get out of trouble or to cause a problem for someone else?

"11. (Relevant) Were you in any way involved in the theft of that diamond ring from the Behavioral Sciences Building last July?" D. Raskin, supra, 1986 Utah L. Rev. 36. The entire sequence is normally gone through three times, after which the examiner scores the result to attempt to reach a determination of truthfulness or deception.

The most common technique for scoring polygraph charts is pure numerical grading. In the most prevalent numerical system, the polygrapher assigns a numerical value along the range of -3 to +3 to each pair of relevant and control questions. A score of +3 indicates a much stronger reaction to the control question than to the relevant question and, therefore, truthfulness; a score of -3 indicates a much stronger reaction to the relevant question and, therefore, deception; and a score of 0 indicates that there was no significant difference in response. The examiner considers only the polygraph chart in assigning these scores; no consideration is given to any subjective impressions regarding the subject's truthfulness that the examiner develops over the course of the exam. The scores for all question pairs in all three sequences are then totaled. If the sum is +6 or greater, the subject is classified as truthful; if the sum is -6 or lower, the subject is classified as deceptive; scores of -5 to +5 are deemed inconclusive. Computers are sometimes used to give more precise numerical scores to polygraph charts.[44]

[44] We note that there is disagreement in the literature even as to what method of scoring is proper. Most authorities agree that numerical scoring is the only valid approach. Nonetheless, many examiners still use "global scoring." See, e.g., D. Lykken, "The Validity of Tests: Caveat Emptor," 27 Jurimetrics J. 263, 264–65 (1987); D. Raskin, supra, 1986 Utah L. Rev. 37. Under this approach, the examiner looks at the subject's relative reactions to the control and relevant questions, but also considers various "clinical impressions," such as the subject's demeanor, in arriving at a conclusion

If an analysis of the first three charts produces inconclusive results, the examiner will often repeat the question sequence twice more. After that, however, further repetitions are generally considered meritless, as the subject will have become habituated to the test questions and, therefore, will no longer have sufficiently strong emotional responses for polygraph purposes.[45] Id., 37–40.

of truthfulness or deception. D. Raskin, supra, 1986 Utah L. Rev. 37. A few authors, albeit generally polygraph detractors, suggest that the global method is, in fact, more accurate. See, e.g., D. Carroll, "How Accurate Is Polygraph Lie Detection?," in The Polygraph Test (A. Gale ed., 1988) pp. 19, 27.

[45] The other main type of polygraph examination used in criminal matters is the guilty knowledge test. The guilty knowledge test "does not attempt to determine whether the [subject] is lying but, rather, whether he or she possesses guilty knowledge, that is, whether the [subject] recognizes the correct answers, from among several equally plausible but incorrect alternatives, to certain questions relating to a crime. For example, escaping through an alley a bank robber drops and leaves behind his hat. A likely suspect is later apprehended and, while attached to the polygraph, he is interrogated as follows:

"1. 'The robber in this case dropped something while escaping. If you are that robber, you will know what he dropped. Was it: a weapon? a face mask? a sack of money? his hat? his car keys?' . . .

"Unlike the control question test, the accuracy of the guilty knowledge test does not depend upon the nature or degree of the subject's emotional concern. The physiological variables employed are not intended to measure emotional response but, rather, to signal the cognitive processes involved in the recognition of the correct alternative." D. Lykken, "The Case Against Polygraph Testing," in The Polygraph Test (A. Gale ed., 1988) pp. 111, 121–23.

"The guilty knowledge test assumes that the guilty subject will have a greater physical response to the 'significant alternative' than would a subject without any guilty knowledge." J. Tarantino, supra, § 6.13, p. 219. Advocates claim that the primary advantage of the guilty knowledge test is that recognition can be more directly measured by physiological data than can truth or deception. D. Lykken, "The Case Against Polygraph Testing," supra, pp. 121–23.

For the guilty knowledge test to work, however, there must be "concealed knowledge" that only the guilty party would know and recognize. This requirement greatly limits the number of cases in which the test can be utilized. P. Giannelli, supra, 30 Crim. L. Bull. 266. In any event, although the guilty knowledge test does have its advocates; D. Lykken, "The Case Against Polygraph Testing," supra, pp. 121–24; B. Kleinmuntz & J. Szucko, supra, 17 Law & Society Rev. 98; the guilty knowledge test's validity is as hotly

2

We now examine the validity of the results produced by the polygraph test.[46] The word "validity" has two meanings in the polygraph context: for the purposes of this discussion, they will be labeled "accuracy" and "predictive value." Courts generally do not specify to which concept they are referring when they address polygraph issues. Maintaining this distinction is essential, however, if one is to evaluate fairly the validity of the polygraph test.

a

The "accuracy" of the polygraph test itself has two components: *sensitivity* and *specificity*. The polygraph's sensitivity is its ability to tell that a guilty person is, in fact, lying. If the polygraph test had a 90 percent sensitivity, then it would correctly label a deceptive subject as being deceptive 90 percent of the time. Thus, the test would incorrectly label a deceptive subject as being truthful 10 percent of the time; this mislabeling is called a "false negative" error. The polygraph's speci-

debated as that of the control question test. C. Honts & M. Perry, supra, 16 Law & Hum. Behav. 359; D. Raskin, supra, 1986 Utah L. Rev. 31–32 n.12 (many guilty people can pass guilty knowledge test). Because the validity of the guilty knowledge test is so uncertain, and because all of the prejudicial effects of allowing control question test evidence apply to guilty knowledge test evidence as well; see part II B 2 b of this opinion; we conclude that guilty knowledge test evidence must also be excluded from use in our courts.

[46] Although courts generally use the word "reliability" when discussing the polygraph test; see, e.g., *United States* v. *Crumby*, 895 F. Sup. 1354, 1358 (D. Ariz. 1995) ("[t]he Court must consider whether polygraph evidence is *reliable* under *Daubert*" [emphasis added]); the concept to which the courts are referring is actually the test's "validity." In the polygraph context, reliability and validity have specialized meanings. Reliability refers only to reproducibility of results, or consistency, while validity relates to the test's actual ability to do what it claims to do, namely, detect deception. 1 C. McCormick, supra, § 206, p. 909 n.28. Reliability is important, but the polygraph debate really centers around the test's validity. See generally S. Blinkhorn, "Lie Detection As a Psychometric Procedure," in The Polygraph Test (A. Gale ed., 1988) pp. 29, 31–35.

ficity is its ability to tell that an innocent person is, in fact, being truthful. If the polygraph test had an 80 percent specificity, then it would label a truthful subject as being truthful 80 percent of the time. The test would thus incorrectly label a truthful subject as being deceptive 20 percent of the time; this mislabeling is called a "false positive" error. It is generally agreed in the literature, by both advocates and critics, that polygraphs have greater sensitivity than specificity; that is, that false positives outnumber false negatives. See, e.g., C. Honts & M. Perry, supra, 16 Law & Hum. Behav. 362; see also *United States* v. *Galbreth*, 908 F. Sup. 877, 885 (D.N.M. 1995).

There is wide disagreement, however, as to what the sensitivity and specificity values actually are for a well run polygraph exam. See generally 1 C. McCormick, supra, § 206, pp. 907–17. Dozens of studies of polygraph accuracy have been conducted. Id. They fall into two basic types, namely, laboratory simulations of crimes[47] and field studies based on data from polygraph examinations in actual criminal cases.[48] P. Giannelli, supra, 30 Crim. L. Bull. 270–73. The variance in expert opinion regarding polygraph accuracy arises from disagreements as to which methods and which studies within

[47] "The most accepted type of laboratory study simulates a real crime in which subjects are randomly assigned to guilty and innocent treatment conditions . . . . Guilty subjects enact a realistic crime, and innocent subjects are merely told about the nature of the crime and do not enact it. All subjects are motivated to produce a truthful outcome, usually by a substantial cash bonus for passing the test." (Citations omitted.) D. Raskin, "Does Science Support Polygraph Testing?," in The Polygraph Test (A. Gale ed., 1988) pp. 95, 99.

[48] "The best available method for field research uses cases in which suspects were administered polygraph tests after which their guilt or innocence was established when the guilty person confessed. Other polygraph examiners are then asked to make diagnoses based solely on the polygraph charts from those tests without knowledge of the guilt or innocence of the subjects or the opinions of the original examiners. The decisions from these blind analyses are then compared to the confession criterion to estimate the accuracy of the polygraph tests." D. Raskin, supra, 1988 Utah L. Rev. 44.

each method are methodologically valid. C. Honts & M. Perry, supra, 16 Law & Hum. Behav. 360.

Polygraph supporters base their accuracy estimates on both laboratory simulation and field studies. These advocates acknowledge that field studies are theoretically preferable for establishing the polygraph test's field accuracy, but they conclude that serious methodological difficulties inherent in such studies, such as establishing the actual guilt or innocence of the study subjects, make most of these studies unreliable. They think, however, that laboratory studies, when designed to approximate field conditions and when carefully conducted, *can* provide useful and valid data. See generally J. Kircher, S. Horowitz & D. Raskin, "Meta-analysis of Mock Crime Studies of the Control Question Polygraph Technique," 12 Law & Hum. Behav. 79, 80 (1988); see also C. Honts & M. Perry, supra, 16 Law & Hum. Behav. 361. David Raskin, perhaps the foremost polygraph advocate in the United States, recently reviewed the literature on polygraph studies and concluded that eight laboratory studies and four field studies of the control question test polygraph technique were methodologically valid. D. Raskin, "The Scientific Status of Research on Polygraph Techniques," in West Companion to Scientific Evidence 2 (Faigman et al. eds., forthcoming 1996), cited in C. Honts & B. Quick, "The Polygraph in 1995: Progress in Science and the Law," 71 N.D. L. Rev. 987, 995, 1018–19 (1995). The laboratory studies that Raskin cites, taken together, indicate that the polygraph test has an 89 percent sensitivity rate and a 91 percent specificity rate;[*] the field studies give an 87 percent

[*] It is interesting that the recent laboratory studies cited here by Raskin as valid give lower aggregate rates for polygraph sensitivity and specificity than did those studies deemed reliable by him in an article he wrote ten years ago. D. Raskin, supra, 1986 Utah L. Rev. 43 (concluding that polygraph has 97 percent sensitivity and 92 percent specificity). It would appear that as testing has advanced, the validity of the polygraph has become more questionable.

sensitivity and a 59 percent specificity.[50] Id. Other studies indicate higher levels of accuracy. See generally P. Giannelli, supra, 30 Crim. L. Bull. 271–73; C. McCormick, supra, § 206, pp. 909–10. The United States Department of Defense, although acknowledging that more research needs to be done, concluded after a thorough review of the literature that there was no "data suggesting that the various polygraph techniques and applications . . . have high false positive or high false negative error rates." United States Department of Defense, The Accuracy and Utility of Polygraph Testing (1984) p. 63.

Critics, however, view the existing body of polygraph studies quite differently. First, although polygraph detractors agree with the advocates that most field studies are invalid due to methodological concerns, they disagree as to which tests *are* valid. David Lykken, a prominent polygraph critic, has concluded from the field tests he deems valid that the polygraph has a sensitivity of 84 percent and a specificity of only 53 percent. D. Lykken, "The Validity of Tests: Caveat Emptor," 27 Jurimetrics J. 263, 264 (1987).[51] Another critic has concluded that reliable field studies indicate that there is "little or no case" for using the polygraph, and that "polygraph lie detection adds nothing positive to conventional approaches to interrogation and assessment." D. Carroll, "How Accurate Is Polygraph Lie Detection?," in The Polygraph Test (A. Gale ed., 1988)

[50] Pursuant to standard practice in calculating specificity and sensitivity, we exclude all of the inconclusive outcomes in the raw data from our calculations, because inconclusive results are not conclusions. See, e.g., C. Honts & B. Quick, supra, N.D. L. Rev. 996 n.65.

[51] Lykken admittedly wrote this assessment before any of the recent field studies on which Raskin relies were published. Nonetheless, there is inarguably a fundamental schism in the type of field study that Raskin and Lykken will regard as valid. For example, the three studies that Lykken deems "scientifically credible"; D. Lykken, supra, 27 Jurimetrics J. 264; are specifically attacked by Raskin as not satisfying even "basic methodological requirements." D. Raskin & J. Kircher, "The Validity of Lykken's Criticisms: Fact or Fancy?," 27 Jurimetrics J. 271, 272 (1987).

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pp. 19, 28. After its own thorough review of the polygraph field studies, the United States Office of Technology Assessment concluded that "the cumulative research evidence suggest that . . . the polygraph test detects deception better than chance, but with significant error rates." OTA Memorandum, supra, reprinted in 12 Polygraph 200.

Moreover, polygraph critics argue that laboratory simulation studies are almost completely invalid. They point out that, although the accuracy of the control question test turns entirely on the subject having the "right" emotional responses, the emotional stimuli in the laboratory are completely different from those in the field. D. Carroll, "How Accurate Is Polygraph Lie Detection?," supra, p. 24. "In the mock crime paradigm . . . it is likely that volunteer subjects regard the experience as a kind of interesting game. Those persons instructed to commit the mock crime and to lie during the test no doubt feel a certain excitement, but not the guilt or fear of exposure that a real thief feels when tested for the police. Volunteers assigned to the innocent group have no reason at all to fear the relevant questions; they are not suspected of any wrongdoing and they will not be punished or defamed even if the test goes awry. On the other hand, the control questions used in laboratory studies . . . unlike the relevant questions, do refer to real-world events and, presumably, have the same embarrassing or disturbing effect on volunteer subjects that they have on criminal suspects. This is probably the reason why mock crime studies typically show a much lower rate of false positive errors than do studies of actual criminal interrogation in the field. Innocent suspects often fail police-administered tests . . . because they find the relevant questions more disturbing than the control questions, since they know they are in real jeopardy in respect to the accusations contained in the relevant questions

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while the controls involve no comparable risk. For the volunteer laboratory subject, this balance is reversed." D. Lykken, "The Case Against Polygraph Testing," in The Polygraph Test (A. Gale ed., 1988) pp. 111, 114–15.[12] Raskin has admitted that these concerns with laboratory simulations are significant. J. Kircher, S. Horowitz & D. Raskin, supra, 12 Law & Hum. Behav. 80, 88–89.

Even if one accepts Raskin's field study estimates of accuracy over those of the polygraph critics, polygraph evidence is of questionable validity. Raskin's 87 percent sensitivity indicates a 13 percent false negative rate. In other words, 13 percent of those who are in fact deceptive will be labeled as truthful. Moreover, Raskin's 59 percent specificity indicates a 41 percent false positive rate. In other words, 41 percent of subjects who are, in fact, truthful will be labeled as deceptive.

b

In the previous section, we demonstrated that the basic *accuracy* of the polygraph test is still open to considerable debate. The actual *probative value* of polygraph evidence as a signifier of guilt or innocence, more-

[12] Lykken describes a laboratory investigation that "succeeded in eliciting genuine concern in both the 'guilty' and 'innocent' examinees. [Two examiners] had forty-eight prison inmates tested in a mock crime situation. It was understood that each participant's bonus of $20 would be withheld if more than ten of the forty-eight subjects failed the polygraph test. Moreover, the names of inmates failing the test would be posted in the prison for all to see. The intent was to make both 'guilty' and 'innocent' subjects believe that, if they failed the test, they might be blamed by their fellow inmates for the loss of the $20, a considerable sum by prison standards. That this manipulation was successful is suggested by the fact that several inmates expressed their concern about the consequences of failing and a few actually declined to participate for that reason. Two skilled and experienced examiners administered control question tests and all charts were independently scored by both examiners. . . . [O]nly thirty of the forty-eight subjects were correctly classified. Excluding inconclusive tests, there were 13 percent false negative errors and 44 percent of the 'innocent' inmates were misclassified as deceptive." D. Lykken, "The Case Against Polygraph Testing," supra, p. 115.

over, is even more questionable. This is because sensitivity, for example, only tells how likely a polygraph is to label accurately a person as deceptive *given that* the person really is lying. At trial, however, we would not yet know that a subject is deceptive—indeed, making that determination may be the entire point of the trial. Knowing how accurately the polygraph test labels deceptive people as deceptive is not, therefore, directly helpful. We are instead interested in a related, but distinct, question: how likely is it that a person really is lying given that the polygraph labels the subject as deceptive? This is called the "predictive value positive." Similarly, at trial we are not directly interested in the polygraph test's specificity, but rather in its "predictive value negative": how likely is it that a subject really is truthful given that the polygraph labels the subject as not deceptive?

Predictive value positive and predictive value negative depend on the sensitivity and specificity of the polygraph test, but also turn on the "base rate"[51] of

[51] The term "base rate" refers to the prevalence of a condition among the relevant tested population. In the context of the polygraph test, the base rate is the percentage of people who submit to a polygraph exam who are, in fact, deceptive on the exam. If, out of every 100 people who take a polygraph test, we could empirically demonstrate that fifty are, in fact, giving deceptive responses, then the base rate of deception would be 50 percent.

The base rate is important because it can greatly accentuate the impact of the false positive and false negative rates arising from any given specificity and sensitivity values. If one assumes base rates progressively higher than 50 percent, then, by definition, the number of deceptive examinees increases and the number of honest examinees decreases. A logical consequence is that, even holding specificity and sensitivity rates constant, as the base rate increases the number of false negatives (the labeling of deceptive subjects as truthful) also rises and the number of false positives (the labeling of truthful subjects as deceptive) falls, because only deceptive subjects produce false negatives and only truthful subjects produce false positives. Likewise, if one were to assume base rates progressively lower than 50 percent, then, even holding sensitivity and specificity constant, as the base rate falls the number of false positives will necessarily rise and the number of false negatives will fall.

For example, a very low base rate would dramatically emphasize the problem of false positives, even if sensitivity and specificity were both

percent of criminal defendants who are willing to sub-

relatively high. Suppose that the polygraph has a sensitivity of 90 percent (and thus a false negative rate of 10 percent) and a specificity of 80 percent (and thus a false positive rate of 20 percent), and that the base rate of deception is 10 percent. If 100 subjects are tested, then the 10 percent base rate signifies that ten subjects are deceptive and ninety are truthful. Given the specificity of 80 percent, seventy-two of the ninety truthful subjects will be labeled accurately as truthful (80 percent of ninety is seventy-two); the remaining eighteen truthful subjects will be mislabeled as deceptive due to the 20 percent false positive rate. Similarly, given the sensitivity of 90 percent, nine of the ten deceptive subjects will be labeled accurately as deceptive (90 percent of ten is nine); the remaining deceptive subject will be mislabeled as truthful due to the 10 percent false negative rate. These results can be summarized as follows:

	Innocent	Guilty
Pass	72	1
Fail	18	9

"A hundred people are tested: 81 percent are correctly classified; 90 percent of the guilty fail; 80 percent of the innocent pass. And yet of those who fail, only one in three is guilty." S. Blinkhorn, "Lie Detection As a Psychometric Procedure," in The Polygraph Test (A. Gale ed., 1988) pp. 29, 34.

[4] Predictive value positive (PVP) and predictive value negative (PVN) are determined by an equation involving the polygraph test's sensitivity and specificity, and the base rate of deception among the tested population. Mathematically, the relationship among these concepts is expressed as follows:

$$PVP = \frac{\pi\eta}{\pi(\eta + \theta - 1) + (1 - \theta)}$$

and:

$$PVN = \frac{\theta(1 - \pi)}{\theta(1 - \pi) + \pi(1 - \eta)}$$

where: π = the base rate of deception among people who choose to take the polygraph exam;

η = the polygraph test's sensitivity; and

θ = the polygraph test's specificity.

See D. Kaye, "The Validity of Tests: Caveant Omnes," 27 Jurimetrics J. 349 (1987).

mit to polygraph tests are actually guilty. D. Raskin, supra, 1986 Utah L. Rev. 59–60. If a base rate of about 50 percent were correct, then, using Raskin's own field derived figures of 87 percent sensitivity and 59 percent specificity, the predictive value positive of the polygraph test would only be 68 percent and the predictive value negative would be 82 percent.[55] That is, even if we were to agree with all of Raskin's figures, we should only be 68 percent confident that a subject really is lying if the subject fails a polygraph exam, and only 82 percent confident that the subject is being truthful if the subject passes. Therefore, although the probative value of the polygraph test may be greater than that of a coin toss, it is not significantly greater, especially for failed tests.[56]

Furthermore, the 50 percent base rate that Raskin posits is far from universally accepted. "[T]he figures for [the base rate] that [Raskin] pull[s] out of the hat should not be taken as firm." D. Kaye, "The Validity of

[55] The figures of 68 percent predictive value positive and 82 percent predictive value negative noted in the text of this opinion are the result of the application of the equation stated in footnote 54, using a base rate of 50 percent, a sensitivity rate of 87 percent, and a specificity rate of 59 percent.

[56] Even if we were to use only Raskin's laboratory derived values for sensitivity and specificity in calculating predictive value positive and predictive value negative, the polygraph test would still be of questionable worth. Assuming an 89 percent sensitivity, a 91 percent specificity and a base rate of 50 percent, the predictive value positive of the polygraph test is only 91 percent and the predictive value negative is only 89 percent. In other words, approximately one out of every ten polygraph examinations would still mislabel the subject.

We emphasize, moreover, that Raskin himself has never advocated assessing the validity of the polygraph examination solely by the use of laboratory data, without reference to field studies. Indeed, for the reasons set forth by the polygraph critics, we are persuaded that it would be reversible error for a trial court to follow such a procedure. Furthermore, to the extent that the previously mentioned figures may appear impressive to some, it is important to remember that, even if one does believe that use of laboratory derived values for sensitivity and specificity is appropriate, the assumed base rate of 50 percent underlying the calculations has essentially no empirical support.

Tests: Caveant Omnes," 27 Jurimetrics J. 349, 357 (1987). Lykken posits, albeit with as equally sparse evidence as Raskin, that the base rate of guilt among people volunteering for a polygraph exam is 80 percent. D. Lykken, supra, 27 Jurimetrics J. 268. Using this base rate, the polygraph test's predictive value positive is 89 percent and its predictive value negative is 53 percent. Lykken's base rate, therefore, makes a failed test more probative than it is under Raskin's base rate, but makes a passed test much less probative.

The *specific* predictive value positive and predictive value negative figures generated by a particular set of assumptions, however, is not the significant point for the legal determination of whether to admit polygraph evidence. The point is that, given the complete absence of reliable data on base rates, we have no way of assessing the probative value of the polygraph test. Under one set of assumptions, a failed test has some significance, while a passed test does not; under another, the situation is reversed. The figures are further muddied when one recalls that the sensitivity and specificity of the polygraph are also hotly debated.

C

Countermeasures are also a concern with regard to polygraph validity. A countermeasure is any technique used by a deceptive subject to induce a false negative result and thereby pass the test. For a countermeasure to work on the control question test, all it must do is "change the direction of the differential reactivity between the relevant and control questions . . . ." G. Gudjonsson, "How to Defeat the Polygraph Tests," in The Polygraph Test (A. Gale ed., 1988) pp. 126, 127.

It may be true that "subjects *without special training* in countermeasures are unable to beat the polygraph test, even if they have been provided with extensive information and suggestions on how they might succeed

. . . ."[67] (Citation omitted; emphasis added.) D. Raskin, "Hofmann, Hypnosis, and the Polygraph," 3 Utah B.J. 7, 8 (1990); G. Gudjonsson, "How to Defeat the Polygraph Tests," supra, p. 135. Yet as one polygraph supporter, Charles Honts, concedes, "studies have indicated that [expert-conducted] training in specific point countermeasures designed to increase [physiological responses to control questions] is effective in producing a substantial number of false negative outcomes . . . ." C. Honts & B. Quick, supra, 71 N.D. L. Rev. 1001. Specifically, "[s]ubjects in these studies were informed about the nature of the control question test and were trained to recognize control and relevant questions. Countermeasure subjects were then instructed to employ a countermeasure (e.g., bite their tongue, press their toes to the floor, or count backward by seven) during the control question zones of a control question test. In one study, none of the guilty subjects who received this brief training was correctly detected . . . . Across all of the studies more than 50 % of the decisions on countermeasures subjects were incorrect." (Citation omitted.) C. Honts & M. Perry, supra, 16 Law & Hum. Behav. 374. Although we share Honts' hope that "the required [expert] training is . . . difficult to obtain"; C. Honts & B. Quick, supra, 71 N.D. L. Rev. 1001; we question whether such is the case and whether it would remain the case if polygraph examination of witnesses became common, especially given the apparent brevity and simplicity of the training in question.

3

With the foregoing information in mind, we will assume, without deciding, that polygraph evidence sat-

[67] But see D. Lykken, supra, 27 Jurimetrics J. 267 ("As it happens, there is a simple, easily learned technique with which a guilty person can 'beat' the control question test. In one informal prison study, twenty-seven inmates accused of violating prison rules were given some fifteen minutes of instruction in this method [by a fellow inmate, based on information provided by Lykken] before reporting for a test concerned with the alleged infraction.

isfies *Daubert*. Although the subjective nature and highly questionable predictive value of the polygraph test weigh heavily against admission, we assume that polygraph evidence may have enough demonstrated validity to pass the *Daubert* threshold for admissibility.

We conclude, however, that admission of the polygraph test would be highly detrimental to the operation of Connecticut courts, both procedurally and substantively. Moreover, as illustrated in part II B 2 b of this opinion, the probative value of polygraph evidence is very low, even if it satisfies *Daubert*. Accordingly, we also conclude that any limited evidentiary value that polygraph evidence does have is substantially outweighed by its prejudicial effects. We therefore reaffirm our per se rule against the use of polygraph evidence in Connecticut courts. See *State* v. *Brown*, supra, 297 Or. 438, 439–42 (polygraph evidence properly not admissible at trial, even though it "may possess some probative value and may, in some cases, be helpful to the trier of fact," because probative value substantially outweighed by prejudicial impact); see also *United States* v. *Black*, 831 F. Sup. 120, 122–23 (E.D.N.Y. 1993) ("That the *Frye* test was displaced by the Rules of Evidence does not mean . . . that the Rules themselves place no limits on the admissibility of purportedly scientific evidence. Nor is the trial judge disabled from screening such evidence. . . . [N]othing in *Daubert* . . . disturb[s] the settled precedent that polygraph evidence is . . . [not] admissible . . . ." [Citations omitted; internal quotation marks omitted.]).

a

The most significant, and fundamental, problem with allowing polygraph evidence in court is that it would

Although all twenty-seven privately admitted their guilt, twenty-four of them managed to pass the polygraph.").

invade the fact-finding province of the jury.[58] The jury has traditionally been the sole arbiter of witness credibility.[59] *State* v. *James*, 237 Conn. 390, 438, 678 A.2d 1338 (1996); *State* v. *Person*, 236 Conn. 342, 347, 673 A.2d 463 (1996); see *State* v. *Mitchell*, 169 Conn. 161, 170, 362 A.2d 808 (1975) (polygraph evidence excluded because "[c]redibility as an issue is committed to the sole determination of the trier of fact"). Indeed, an underlying premise of our legal system is that the jury is capable in this regard. Accordingly, we generally disallow expert testimony as to witness credibility when the subject matter of the testimony "is within the knowledge of jurors and expert testimony [therefore] would not assist them . . . ." *State* v. *Kemp*, 199 Conn. 473, 477, 507 A.2d 1387 (1986); *State* v. *Boscarino*, 204 Conn. 714, 733, 529 A.2d 1260 (1987) (expert testimony on reliability of eyewitness identifications properly excluded).

A determination of whether a witness is telling the truth is well within the province of all jurors' understanding and abilities.[60] Indeed, one polygraph skeptic,

[58] Cf. *Perkins* v. *State*, 902 S.W.2d 88, 94 (Tex. App. 1995) ("Even though serious doubts remain about the reliability of polygraph evidence, its unreliability is not the primary reason for its exclusion under our holding. Instead, we find that such evidence should be excluded because it impermissibly decides the issues of credibility and guilt for the trier of fact and supplants the jury's function.").

[59] The defendant suggested at oral argument that polygraph evidence would not impinge on the province of the jury at all because it would not directly address witness credibility. He proposes limiting testimony of the polygrapher to whether a subject's physiological responses are consistent with those of most people when telling the truth or lying, rather than allowing the polygrapher to testify as to an opinion of the subject's actual truthfulness or deception. This is certainly a more honest approach, but we nonetheless recognize that, in the context of trial testimony, the message conveyed to the jury by both styles of testimony would be the same. Furthermore, altering the technical format of the evidence does not alter the general balance between its probative value and prejudicial impact.

[60] By contrast, we allow expert testimony as to the general behavior patterns of battered women and sexual assault victims, even though such testimony also implicates witness credibility, specifically because such mat-

after reviewing the literature, concluded that any observant person can assess witness truthfulness as well as a trained polygrapher: "[I]t would appear that an observer, regarding the [polygraph examinee's] general behavior . . . does just as well as an experienced polygraph examiner . . . ." D. Carroll, "How Accurate Is Polygraph Lie Detection?," supra, p. 28. Most scientific testimony is facially different from polygraph evidence, however, in that it involves matters that jurors *cannot* assess on their own. A juror cannot, for example, determine whether a blood stain contains DNA consistent with that of a particular individual without expert assistance and testimony.

Very few studies have been done on the influence that polygraph evidence has over juries, and the cumulative results of those studies are inconclusive.[61] In view of

ters are *not* within the understanding and personal knowledge of the average juror. See *State* v. *Borrelli*, 227 Conn. 153, 173–74, 629 A.2d 1105 (1993) (expert may testify regarding battered women's syndrome because such testimony addressed issues "that in all likelihood were beyond the jury's experience and knowledge"); *State* v. *Spigarolo*, 210 Conn. 359, 378, 556 A.2d 112, cert. denied, 493 U.S. 933, 110 S. Ct. 322, 107 L. Ed. 2d 312 (1989) (expert testimony regarding typical behavior patterns of children who are sexual assault victims "is admissible because the consequences of [this] unique trauma . . . are matters beyond the understanding of the average person").

[61] The earliest reported study of the impact of polygraph evidence on a jury was in connection with a robbery prosecution in *People* v. *Kenny*, 167 Misc. 51, 3 N.Y.S.2d 348 (1938). Ten jurors responded to a mailed questionnaire regarding their reaction to the polygraph evidence submitted in that case. Five accepted the testimony of the lie detector expert " 'without question,' " and six felt the lie detector testimony was conclusive proof of the defendant's innocence. Id.; S. Carlson, M. Passano & J. Jannuzzo, "The Effect of Lie Detector Evidence on Jury Deliberations: An Empirical Study," 5 J. Police Sci. & Admin. 148, 149 (1977).

Of course jurors, and society as a whole, have become more technologically sophisticated over the last sixty years. Nonetheless, more recent studies, although inconclusive, do not dispel the fear that juries will give undue weight to polygraph results. Each of eight jurors interviewed after the conclusion of a federal drug case, for example, indicated that, in a close case, the polygraph tests standing by themselves would be sufficient to raise reasonable doubt. F. Barnett, "How Does a Jury View Polygraph Examination

the importance of maintaining the role of the jury, this uncertainty alone justifies the continued exclusion of polygraph evidence. Moreover, polygraph evidence so directly abrogates the jury's function that its admission is offensive to our tradition of trial by jury. Indeed, the specter of polygraph evidence demonstrates why the traditional role of the jury in assessing credibility is so important and should be guarded so assiduously.

A polygrapher can ascertain a witness' deception or truth only indirectly, through physical manifestations thereof. It is unfair, however, to label a person as truthful or a liar based solely on such indirect, secondary indicia as a polygraph provides. Although a juror also considers secondary indicia, like demeanor, in assessing a witness' credibility, the juror has access to the rest of the evidence in the case as well, giving the

Results?," 2 Polygraph 275, 276 (1973). In another study, one quarter of the jurors in a mock trial competition indicated that they would change their votes if contrary polygraph evidence that was stated to be 95 percent accurate were presented to them, while another one quarter stated they were uncertain what they would do. S. Carlson, M. Pasano & J. Jaumuzzi, supra, 5 J. Police Sci. & Admin. 152; see also A. Markwart & B. Lynch, "The Effect of Polygraph Evidence on Mock Jury Decision-Making," 7 J. Police Sci. & Admin. 324 (1979).

The most scientific study on this topic to date is reported in A. Cavoukian & R. Heslegrave, "The Admissibility of Polygraph Evidence in Court: Some Empirical Findings," 4 Law & Hum. Behav. 117 (1980). In one experiment discussed therein, 52 percent of mock jurors in a control group found a defendant "guilty" based on a written fact pattern, whereas only 28 percent found the defendant "guilty" when exculpatory polygraph evidence with a stated accuracy of 80 percent was added. Id., 121, 123. A cautionary statement by the judge in the fact pattern regarding the limitations of polygraph reliability somewhat mitigated the effect of polygraph evidence. Id., 121, 128. A second study demonstrated, however, that when an antipolygraph expert was added to the fact pattern, who testified that polygraph results should be treated "with skepticism," the effect of the polygraph evidence was almost completely eliminated.

Given the limited number and scope of the extant studies, and the equivocal conclusions thereof, definitive contentions that jurors will blindly follow polygraph evidence; see, e.g., *United States* v. *Alexander*, 526 F.2d 161, 169 (8th Cir. 1975); or that they will not; C. Honts & M. Perry, supra, 16 Law & Hum. Behav. 366; seem equally unfounded.

juror several points of reference on which to base an assessment.[62] In this way, a witness is not wrongly condemned, or elevated, solely because his or her body does not act in the "right" way.

Moreover, we afford criminal defendants the right to trial by a panel of several jurors partly out of the recognition that, although one person may be misled when a witness gives the "incorrect" physical signals, the cumulative impressions of the group are likely to lead to the truth. It violates the premise of this entire system to allow a single person—the polygrapher—to label a witness as honest or as dishonest based solely on the same type of indirect evidence that we generally maintain takes an entire jury to evaluate.

In this regard, we do not dispute that polygraphers may often reach a correct *conclusion* regarding a subject's guilt or innocence.[63] We conclude, however, that

[62] This argument applies equally to the judge's role as fact finder at a bench trial.

[63] It is interesting to note that critics of the *Frye* rule and critics of polygraph exclusion in general have on occasion asserted Frye's factual innocence as part of their arguments. "The premise appears to be that if, in truth, Frye was innocent of the crime charged, then the rule in the case is the culprit, for it permitted an innocent man to be convicted when science was ready and able to exonerate him. In the absence of the *Frye* court's parochial, constraining attitude toward the efficacy of scientific evidence, or so the proponents of this position seem to say, an innocent man would not have been unjustly convicted of murder and punished for it." J. Starrs, "'A Still-Life Watercolor': *Frye* v. *United States*," 27 J. Forensic Sci. 684, 687 (1982); see also footnotes 2 and 80. Thus, authors have at various times asserted that someone else confessed to the murder for which Frye was convicted; see, e.g., W. Wicker, "The Polygraphic Truth Test and the Law of Evidence," 22 Tenn. L. Rev. 711, 715 (1953); and that Frye was thereafter pardoned. See, e.g., P. Giannelli, supra, 80 Colum. L. Rev. 1204 n.42.

Subsequent scholarship has demonstrated, however, that both the third party confession and the pardon arising therefrom are nothing more than "folklore," and that, in fact, Frye served eighteen years in jail before being paroled. See generally J. Starrs, supra, 27 J. Forensic Sci. 690, 692. Moreover, even if Frye had, in fact, been innocent, we conclude, for the reasons discussed in the text of this opinion, that the court in *Frye* was nonetheless correct to exclude the sphygmomanometer evidence.

this fact, in and of itself, is irrelevant. As illustrated in part II B 2 of this opinion, the ability of the polygraph *technique* to tell whether a subject is lying or telling the truth is still highly questionable. Thus, one cannot say with any degree of certainty that a polygrapher's ultimate conclusion about a subject's veracity is in fact based upon the polygraph machine—that is, based upon science. It is just as likely, if not more likely, that a polygrapher's conclusion will be based either on chance or on his or her general impressions of the subject's credibility. An assessment of witness credibility based simply on chance or on intuition is not, however, admissible at trial. See generally C. Tait & J. LaPlante, supra, §§ 7.18 through 7.28 (credibility of witness can only be bolstered by certain methods, and only after credibility has been impeached). Indeed, forming impressions and intuitions regarding witnesses is the quintessential jury function; moreover, to the extent possible, luck should be excluded from the assessment process altogether.

Accordingly, the fact that a polygrapher's ultimate assessment *happens* to be right does not mean that it should be admitted at trial. If that opinion was not arrived at objectively through scientific principles and proof, then it is immaterial whether it happens to be correct because it was not based on any information that the jury itself could not have gleaned through its own observations. Because one cannot say with a high degree of certainty that a polygrapher's conclusion is based firmly in objective, scientific truth, and because one therefore cannot say that polygraph evidence provides a better informed assessment of a witness' credibility than the personal observations of each juror, allowing polygraph testimony would be a direct invasion of the province of the jury.

b

Furthermore, admission of polygraph test results at trial would likely produce regular, and immensely time

consuming, "battles of the experts." Cf. *Commonwealth* v. *Mendes*, 406 Mass. 201, 202–203, 547 N.E.2d 35 (1989) (even after fifteen years of experience with polygraph evidence, evidentiary hearing consumed four days of court time). Admittedly, such a battle is common whenever scientific evidence is offered in court, and many types of scientific evidence are nonetheless routinely admitted at trials. In those instances, however, the probative value of the evidence is such that the delay attendant to the admission of the evidence is warranted. Because polygraph evidence is of such dubious probative value, however, the prejudicial impact of the likely delays weighs more heavily against admission.

Indeed, polygraph evidence is especially likely to cause disruptive conflicts between experts. Even polygraph advocates admit that "a substantial proportion of those who conduct tests in the public and private sectors lack adequate training and competence." D. Raskin, supra, 1986 Utah L. Rev. 66–67; see also C. Honts & B. Quick, supra, 71 N.D. L. Rev. 998–99. Although expert qualification is always an issue with regard to scientific evidence, it is of particular import in the polygraph case.

With most types of scientific evidence, and especially with psychological tests, there are certain set procedures that are generally deemed to give accurate results. S. Blinkhorn, "Lie Detection As a Psychometric Procedure," in The Polygraph Test (A. Gale ed., 1988) pp. 29, 30–31. The expert debate in the courtroom simply focuses on whether these generally accepted, fixed procedures were adequately observed. This process ensures a certain level of "quality control."

There is, however, little standardization of polygraph test procedures. Id. With the polygraph test, each administration of a control question test is necessarily different, with appropriate control and relevant ques-

tions chosen and formulated by each individual examiner. As a result, a battle of the experts over polygraph evidence cannot simply address whether "the" test was properly administered. In the case of the control question test, for example, the experts will have to debate both whether the standardized control question test format was properly observed, *and* whether the *particular, nonstandardized* questions involved, *as chosen by the examiner*, were theoretically sound.[64] The latter point will require an in-depth examination of the polygrapher's credentials. This additional layer of controversy will cause the qualification and questioning of experts to consume even more courtroom time than it ordinarily does.

Furthermore, the very nature of the polygraph test makes extensive expert battles inevitable. Many experts dispute that the polygraph has any value whatsoever. By contrast, much other scientific evidence is premised on tests and procedures that are generally accepted at least in the abstract, if not as performed in a particular case. For example, the "basic genetic theory underlying DNA profiling [restriction fragment length polymorphism analysis] essentially is undisputed." J. McKenna, J. Cecil & P. Coukos, "Reference Guide on Forensic DNA Evidence," in Reference Manual on Scientific Evidence, J. Moore, Federal Practice (1995) pp. 273, 285. Because many experts doubt the entire physiological and emotional basis of the polygraph test,[65] many court-

[64] Asking questions such as those used in the present case, involving such phrases as "do you know for sure," renders answers "chimerical" at best. *United States* v. *Kwong*, supra, 69 F.3d 668. The formulation of such questions adds to their prejudicial impact.

[65] Many experts assert that polygraph practitioners have completely failed to establish that the physical data produced by the polygraph machine are linked to deception, as opposed to other emotions, and thus that the physiological responses actually recorded by the polygraph have any regular correlation with a deceptive state of mind, as opposed to general anxiety. See, e.g., T. Ney, "Expressing Your Emotions and Controlling Feelings," in The Polygraph Test (A. Gale ed., 1988) p. 65. Moreover, there has been no

room skirmishes will be fought over the scientific validity of the entire polygraph procedure.

Polygraph results are ripe for in-court expert controversy, moreover, because, as previously discussed, the polygraph measures deception only *indirectly*, by gauging a subject's physiological state. The examiner must formulate questions that will properly link actual deception to physiological responses and relate the responses to those questions back to truth or deception. Other types of scientific evidence *directly* address an objective fact. Ballistics evidence, for example, directly addresses whether a particular bullet could have come from a particular gun, based on directly relevant physical indicators. With the polygraph test, however, the physiological test results can be linked to truth or deception only through the polygrapher's interpretation. This nexus between polygraph chart and polygraph significance is easily attacked by competing experts, and is likely to consume significant court time. Cf. M. Abbell, "Polygraph Evidence: The Case Against Admissibility in Federal Criminal Trials," 15 Am. Crim. L. Rev. 29, 41 (1977) ("even under optimal conditions, the results of polygraph examinations lack the reliability of the typical objective forensic tests which are admissible in evidence" due to uniquely subjective manner in which polygraph exams are interpreted).

c

Finally, there is a risk that, if polygraph evidence were admissible, juries would come to expect it with regard to *all* witnesses, a possibility that implicates both of the aforementioned concerns. Indeed, one wonders whether juries would draw adverse inferences against

investigation of whether individuals in different social, racial and ethnic subgroups have different emotional responses when confronted with a polygraph test. S. Blinkhorn, "Lie Detection As a Psychometric Procedure," supra, p. 39.

the witness whenever such evidence was not presented, or whether a *Secondino* instruction would be warranted.[66] These admittedly minor issues would be less important if polygraph evidence had substantial probative value for the fact finder. As matters stand, however, this Pandora's box of subsidiary concerns further weighs against allowing the use of polygraph evidence at trial.

C

Our decision to maintain our per se rule of exclusion with regard to polygraph evidence is consistent with the conclusion of the majority of courts that have considered this issue. State appellate courts, for whom *Daubert* is not mandatory authority, largely agree with our assessment that the prejudicial impact of polygraph evidence outweighs its probative value. As a result, approximately one half of the states have an absolute rule barring admission of polygraph evidence in criminal cases. See, e.g., *People* v. *Sanchez*, 169 Ill. 2d 472, 662 N.E.2d 1199, 1210 (1996).[67] Several of these courts

[66] *Secondino* v. *New Haven Gas Co.*, 147 Conn. 672, 676, 165 A.2d 598 (1960), and its progeny entitle a party to an adverse inference instruction if an opposing party fails to produce available evidence that, if favorable to that party, would naturally be produced.

[67] See also *Pulakis* v. *State*, 476 P.2d 474, 479 (Alaska 1970); *People* v. *Anderson*, 637 P.2d 354, 361 (Colo. 1981); *Smith* v. *United States*, 389 A.2d 1356, 1359 (D.C.), cert. denied sub nom. *Washington* v. *United States*, 439 U.S. 1048, 99 S. Ct. 726, 58 L. Ed. 2d 707 (1978); *State* v. *Okumura*, 78 Haw. 383, 397, 894 P.2d 80 (1995); *Morton* v. *Commonwealth*, 817 S.W.2d 218, 221–22 (Ky. 1991); *State* v. *Harnish*, 560 A.2d 5, 8 (Me. 1989); *State* v. *Hawkins*, 326 Md. 270, 275, 604 A.2d 489 (1992); *State* v. *Anderson*, 379 N.W.2d 70, 79 (Minn. 1985), cert. denied, 476 U.S. 1141, 106 S. Ct. 2248, 90 L. Ed. 2d 694 (1986); *State* v. *Biddle*, 599 S.W.2d 182, 191 (Mo. 1980); *State* v. *Staat*, 248 Mont. 291, 292, 811 P.2d 1261 (1991); *State* v. *Steinmark*, 195 Neb. 545, 548, 239 N.W.2d 495 (1976); *Petition of Grimm*, 138 N.H. 42, 54–55, 635 A.2d 456 (1993); *Commonwealth* v. *Brockington*, 500 Pa. 216, 220, 455 A.2d 627 (1983); *State* v. *Hart*, 911 S.W.2d 371, 377–78 (Tenn. App. 1995); *Romero* v. *State*, 493 S.W.2d 206, 213 (Tex. Crim. App. 1973); *State* v. *Hamlin*, 146 Vt. 97, 108–110, 499 A.2d 45 (1985); *Robinson* v. *Commonwealth*, 231 Va. 142, 156, 341 S.E.2d 159 (1986); *State* v. *Beard*, supra, 194 W. Va. 747;

have specifically held that the *Daubert* standard does not require admission of polygraph evidence, in light of the polygraph's questionable reliability and prejudicial impact. See, e.g., *State* v. *Beard*, supra, 194 W. Va. 746–47.

The majority of the remaining states that have considered the issue admit polygraph evidence at trial only when its admission is stipulated to in advance by all parties.[68] See, e.g., *State* v. *Webber*, 260 Kan. 263, 918 P.2d 609, 620 (1996).[69] Even the jurisdictions that allow polygraph evidence by stipulation, however, generally do not assert that the evidence is probative, or that it gains validity by means of the stipulation. Instead, the allowance is simply based on the parties' right to waive

cf. *People* v. *Angelo*, 88 N.Y.2d 217, 223, 666 N.E.2d 1333, 644 N.Y.S.2d 460 (1996) (polygraph evidence properly excluded where there continues to be no showing that such evidence is generally accepted as reliable by scientific community).

[68] "Stipulation" in this context refers to a practice whereby both parties agree, *before* a subject takes a polygraph exam, that the results thereof will be admissible, but that the adversely affected party retains the right to cross-examine the polygraph witness and otherwise to attempt to impeach the polygraph evidence.

[69] See also *Ex parte Clements*, 447 So. 2d 695, 698 (Ala. 1984); *State* v. *Valdez*, 91 Ariz. 274, 283, 371 P.2d 894 (1962); *Holcomb* v. *State*, 268 Ark. 138, 140, 594 S.W.2d 22 (1980); *People* v. *Fudge*, 7 Cal. 4d 1075, 1122, 875 P.2d 36, 31 Cal. Rptr. 2d 321 (1994), cert. denied, U.S. , 115 S. Ct. 1367, 131 L. Ed. 2d 223 (1995) (based on Cal. Evid. Code § 351.1 [Deering 1986], barring admission of any evidence relating to polygraph test in all criminal prosecutions); *Melvin* v. *State*, 606 A.2d 69, 71 (Del. 1992); *Delap* v. *State*, 440 So. 2d 1242, 1247 (Fla. 1983), cert. denied, 467 U.S. 1264, 104 S. Ct. 3560, 82 L. Ed. 2d 860 (1984); *Ferguson* v. *State*, 266 Ga. 463, 467 S.E.2d 551, 553 (1996); *State* v. *Fain*, 116 Idaho 82, 86–87, 774 P.2d 252, cert. denied, 493 U.S. 917, 110 S. Ct. 277, 107 L. Ed. 2d 258 (1989); *Harris* v. *State*, 481 N.E.2d 382, 384 (Ind. 1985); *State* v. *Lasee*, 354 N.W.2d 239, 242 (Iowa 1984); *Corbett* v. *State*, 94 Nev. 643, 644, 584 P.2d 704 (1978); *State* v. *McIlwitt*, 62 N.J. 36, 46, 297 A.2d 849 (1972); *State* v. *Souel*, 53 Ohio St. 2d 123, 129–34, 372 N.E.2d 1318 (1978); *State* v. *Eldredge*, 773 P.2d 29, 37 (Utah), cert. denied, 493 U.S. 814, 110 S. Ct. 62, 107 L. Ed. 2d 29 (1989); *State* v. *Renfro*, 96 Wash. 2d 902, 905–907, 639 P.2d 737, cert. denied, 459 U.S. 842, 103 S. Ct. 94, 74 L. Ed. 2d 86 (1982); *Schmunk* v. *State*, 714 P.2d 724, 731 (Wyo. 1986).

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evidentiary objections. See, e.g., *Delap* v. *State*, 440 So. 2d 1242, 1247 (Fla. 1983). We are unpersuaded by this rationale. In our view, the limited reliability of polygraph evidence, taken together with its significant potential for prejudicial effect, compel the conclusion that such evidence should remain inadmissible even pursuant to a stipulation.[70]

Of the states that do allow polygraph evidence without a stipulation, most allow it only in proceedings other than at trial. See, e.g., *State* v. *Catanese*, 368 So. 2d 975, 981–83 (La. 1979) (admissible in posttrial proceedings).[71] Only a very few states actually allow polygraph evidence that has not been stipulated to at the trial itself. See, e.g., *Conner* v. *State*, 632 So. 2d 1239, 1257–59 (Miss. 1993) (evidence of willingness to take polygraph test admissible to rehabilitate impeached witness); *State* v. *Sanders*, 117 N.M. 452, 872 P.2d 870, 877 (1994) (polygraph evidence authorized by local rule of evidence under supervision of trial court);[72] *State* v.

[70] If, however, *after* a subject undergoes a polygraph examination, the adversely affected party believes that the examination did, in fact, result in an accurate factual determination, that party is of course free to stipulate to the results of the examination and, therefore, to the truth of those facts. In such a situation, however, it is difficult to believe that the case would actually be tried.

[71] See also *State* v. *Jones*, 110 Ariz. 546, 551, 521 P.2d 978 (no error when polygraph results considered by sentencing judge), cert. denied, 419 U.S. 1004, 95 S. Ct. 324, 42 L. Ed. 2d 280 (1974), overruled in part on other grounds, *State* v. *Conn*, 137 Ariz. 148, 151, 669 P.2d 581 (1983); *People* v. *Barbara*, 400 Mich. 352, 359, 255 N.W.2d 171 (1977) (admissible in postconviction hearing for new trial); *State* v. *Bartholomew*, 101 Wash. 2d 631, 646, 683 P.2d 1079 (1984) (admissible at sentencing phase of capital cases).

[72] In 1975, the New Mexico Supreme Court rejected its per se rule of polygraph exclusion, in the absence of a stipulation, as unnecessarily "mechanistic in nature." *State* v. *Dorsey*, 88 N.M. 184, 185, 539 P.2d 204 (1975). In 1983, that court adopted rule of evidence § 11-707, N.M. Stat. Ann. § 11-707 (Michie 1994), in an attempt to standardize the requirements for polygraph evidence admission and thereby minimize the prejudicial effects thereof. The prerequisites for admissibility established by § 11-707, including minimum polygrapher qualifications under N.M. Stat. Ann. § 11-707 (B) (Michie 1994), and the procedure for administering and scoring the exam that must be

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Wright, S.C. , 471 S.E.2d 700, 701 (1996) (polygraph admissibility at discretion of trial court, but should usually be excluded due to prejudicial effects). These states have concluded that, at least under certain circumstances, polygraph evidence is sufficiently more probative than prejudicial to warrant admission. For the reasons discussed in part II B of this opinion, however, we disagree, and instead conclude in agreement with the majority of states that such a balance in favor of admissibility is not, in fact, ever reached.

In this regard, it is particularly instructive to note that several courts, after experimenting with polygraph admissibility for several years, rejected its admissibility and reinstated the traditional rule of inadmissibility. In each case, the court realized that its earlier assessment, namely, that the probative value of polygraph evidence outweighed its prejudicial impact, was mistaken. For example, in 1974 the Massachusetts Supreme Judicial Court decided to allow polygraph evidence for the limited purpose of corroborating or impeaching a defendant's trial testimony. *Commonwealth* v. *A Juvenile*, 365 Mass. 421, 425–26, 313 N.E.2d 120 (1974). The court concluded that "polygraph testing has advanced to the point where it could prove to be of significant value to the criminal trial process if its admissibility initially is limited to carefully defined circumstances designed to protect the proper and effective administration of criminal justice." Id., 425.

In 1989, however, the court reconsidered its position. *Commonwealth* v. *Mendes*, supra, 406 Mass. 201. After

followed under N.M. Stat. Ann. § 11-707 (C) (Michie 1994), probably somewhat mitigate the prejudicial impact of polygraph evidence. Nonetheless, many of our concerns regarding such evidence, including its fundamental inaccuracy and improper invasion of the province of the jury, remain unaddressed, while others, such as the potential expert battles over examiner qualifications and test procedures, although addressed, seem likely to remain to a greater or lesser extent even under the statute.

noting that the polygraph evidentiary hearing in *Mendes* had "consumed four days" of trial court time; id., 202; the court concluded that polygraph evidence continued to suffer from serious shortcomings, including the subjective nature of the polygraph method; the uncertain validity of polygraph evidence; the danger of proliferating a "battle of experts"; the danger of confusing the jury; the danger of usurping the jury's role; and the burden placed on trial courts in conducting evidentiary hearings. Id., 211. The court concluded that "[f]ifteen years has been more than enough time for examination and evaluation [of polygraph evidence]. . . . Further hope or expectation . . . is no longer warranted. . . . Accordingly, supported by the overwhelming authority throughout the country, we announce that polygraphic evidence, with or without pretest stipulation, is inadmissible in criminal trials in this Commonwealth . . . ." Id., 212.

Similarly, after a seven year experiment with admitting polygraph evidence on stipulation, the Wisconsin Supreme Court reinstated its per se exclusionary rule, concluding that "the burden on the trial court to assess the reliability of stipulated polygraph evidence [outweighs] any probative value the evidence may have." *State* v. *Dean*, 103 Wis. 2d 228, 279, 307 N.W.2d 628 (1981). In 1974, the Wisconsin Supreme Court had decided to allow polygraph evidence to corroborate or impeach a defendant's testimony when: (1) all parties stipulated to admissibility; (2) the trial court had the discretion to reject such evidence notwithstanding the stipulation; (3) the party against whom such evidence was offered was allowed an opportunity for thorough cross-examination of the polygrapher; and (4) the jury was instructed that such evidence was only to be considered for corroborative purposes, and that they were free to determine what weight such evidence should be given. *State* v. *Stanislawski*, 62 Wis. 2d 730, 742–43, 216 N.W.2d 8 (1974). As applied over the next several

years, however, the *Stanislawski* rule created substantial practical problems in Wisconsin's trial courts. For example, it became unclear exactly what type of hearing, if any, the second *Stanislawski* prong required, and what standard appellate courts should use in reviewing a trial court's determination of polygraph reliability. *State* v. *Dean*, supra, 270. Under the third prong, it was unclear whether the party adversely affected by polygraph evidence could call its own experts to testify that polygraphs were unreliable. Id., 274–75. On account of these and similar problems, the Wisconsin Supreme Court in 1981 held polygraph evidence inadmissible in criminal trials. Id., 279. "Our analysis of and our experience with the *Stanislawski* rule lead us . . . to conclude that the *Stanislawski* conditions are not operating satisfactorily to enhance the reliability of the polygraph evidence and to protect the integrity of the trial process as they were intended to do." Id.

North Carolina and Oklahoma also allowed stipulated polygraph results for a brief time, then retreated to a per se rule of inadmissibility. *State* v. *Grier*, 307 N.C. 628, 643, 300 S.E.2d 351 (1983) ("[W]e are forced to conclude that the administration of justice simply cannot, and should not, tolerate the incredible burdens involved in the process of ensuring that a polygraph examination has been properly administered. If a trial court were to adequately police the reliability of stipulated results, the time required to explore the innumerable factors which could affect the accuracy of a particular test would be incalculable."); *Fulton* v. *State*, 541 P.2d 871, 872 (Okla. 1975).

In all, then, four states that at one time allowed polygraph evidence have subsequently, in light of their experiences, rethought and rejected this policy. Although not a decisive justification for our decision to retain our per se exclusionary rule, this pattern leads us to conclude that our concerns are, in fact, well founded.

Federal appellate courts generally grant trial judges more leeway to admit polygraph evidence than do their state counterparts, especially in the wake of *Daubert*.[73] Indeed, the majority of federal courts of appeals do not have a per se rule that polygraph evidence is inadmissible at trial. Nonetheless, most maintain that, although admission is within the discretion of the trial court, such evidence should, as a general policy, be excluded under rule 403 of the Federal Rules of Evidence.[74]

The Court of Appeals for the Eleventh Circuit has gone further than any other federal appellate court toward allowing polygraph evidence at trial in the

[73] Only the Courts of Appeals for the Fourth and the District of Columbia Circuits currently maintain a per se rule of polygraph inadmissibility. See *United States* v. *A & S Council Oil Co.*, 947 F.2d 1128, 1133–34 and n.4 (4th Cir. 1991) (affirming per se exclusion but noting that "[c]ircuits that have not yet permitted evidence of polygraph results for any purpose are now in the decided minority"); *United States* v. *Skeens*, 494 F.2d 1050, 1053 (D.C. Cir. 1974).

Moreover, only the Eighth Circuit Court of Appeals limits polygraph evidence at trial to instances where its admissibility has been stipulated to by both parties. See *Houston* v. *Lockhart*, 982 F.2d 1246, 1251–52 (8th Cir. 1993); but see *United States* v. *Williams*, 95 F.3d 723, 729–30 (8th Cir. 1996) (implying that polygraph evidence that has not been stipulated to may be admissible pursuant to *Daubert* if trial court finds that such evidence satisfies rule 403 of Federal Rules of Evidence).

[74] See, e.g., *United States* v. *Cordoba*, 104 F.3d 225, 228 (9th Cir. 1997) (although *Daubert* precludes per se rule of polygraph inadmissibility, "[t]he inherent problematic nature of such evidence remains," and polygraph evidence is still subject to rule 403); *United States* v. *Shorlin*, 67 F.3d 1208, 1216 (6th Cir. 1995) (even if polygraph evidence is admissible under *Daubert*, " 'unilaterally obtained polygraph evidence is almost never admissible under Evidence Rule 403' "); *United States* v. *Posado*, 57 F.3d 428, 435–36 (5th Cir. 1995) (although *Daubert* provides the proper threshold for admissibility of polygraph evidence, rule 403 must be satisfied as well); see also *United States* v. *Scheffer*, 44 M.J. 442, 446–47 (C.M.A. 1996). The Second Circuit Court of Appeals, while admitting it had not yet been presented with a record adequate to explore fully the polygraph issue, also recently affirmed a district judge's rejection of polygraph evidence on rule 403 grounds, even in light of *Daubert*. *United States* v. *Kwong*, supra, 69 F.3d 668–69. The First Circuit Court of Appeals recently reaffirmed that "polygraph examinations are generally inadmissible" as well. *United States* v. *Black*, 78 F.3d 1, 7 (1st Cir. 1996).

absence of a stipulation. See *United States* v. *Piccinonna*, 885 F.2d 1529 (11th Cir. 1989). In *Piccinonna*, the court summarily concluded that, while polygraphy is still "a developing and inexact science," it is a sufficiently "useful and reliable scientific tool" to justify its admission to impeach or corroborate the testimony of a witness at trial, even without a stipulation. Id., 1535–36. The court did emphasize, however, that "[n]either of these two modifications to the per se exclusionary rule should be construed to preempt or limit in any way the trial court's discretion to exclude polygraph expert testimony on other grounds under the Federal Rules of Evidence." Id., 1536.

District courts in the Eleventh Circuit were thus given broader license to admit polygraph evidence than were district courts in any other circuit. It is noteworthy, therefore, that they have almost unanimously declined to do so.[75] In fact, only one reported district court opinion from the Eleventh Circuit has held polygraph evidence admissible at trial. *United States* v. *Padilla*, 908 F. Sup. 923 (S.D. Fla. 1995). The court in *Padilla* conceded that "the polygraph examination at issue here does not have substantial probative value," but concluded nonetheless that polygraph evidence "will not disrupt the trial *enough* to conclude that its prejudicial effect substantially outweighs its probative value." (Emphasis in original.) Id., 929. Of particular note, however, is the court's acknowledgment that, but for the existence of *Piccinonna*, it probably would have *excluded*

[75] *See United States* v. *One Parcel of Real Estate*, 804 F. Sup. 319, 322 (S.D. Fla. 1992) (polygraph evidence excluded after proponent failed to lay adequate foundation for expert testimony as required by rule 702 of Federal Rules of Evidence); *Elortegui* v. *United States*, 743 F. Sup. 828, 830 n.4 (S.D. Fla. 1990) (noting in dicta that use of polygraph to corroborate defendant's testimony "clearly could [be] excluded . . . under rule 403 on the grounds that it [is] cumulative"); *United States* v. *Piccinonna*, 729 F. Sup. 1336, 1338 (S.D. Fla. 1989) (on remand, trial court found that polygraph evidence failed to satisfy rule 608 [a] of Federal Rules of Evidence).

the polygraph evidence. Id., 927 n.2. In other words, the court allowed the polygraph evidence to fulfill what it viewed as the mandate of *Piccinonna*, and not because its independent analysis was that such admission was wise or legally sound. Thus, even when presented with an opportunity to admit polygraph evidence, most district courts are decidedly reluctant to do so.[76]

[76] The most substantial of the few federal opinions permitting polygraph evidence at trial comes from the District Court of New Mexico. *United States* v. *Galbreth*, supra, 908 F. Sup. 877. The Tenth Circuit Court of Appeals had only addressed the question of polygraph admissibility before *Daubert* had been released; see *United States* v. *Scheffer*, 523 U.S. 303, 118 S. Ct. 1261, 140 L. Ed. 2d 413 (1998); *United States* v. *Rodriguez-Berrios*, 573 F.2d 1241, 1249 (10th Cir. 1978); *United States* v. *Call*, 129 F.3d 1402, 1997 WL 714 (10th Cir. 1997); *United States* v. *Piper*, 298 F.3d 1047, 1054 (10th Cir. 2002); *United States* v. *Rushing*, 935 F.2d 454, 458 (2d Cir. 1991); *United States* v. *Prince-Oyibo*, 320 F.3d 494, 499 (4th Cir. 2003); *United States* v. *Posado*, 57 F.3d 428, 434 (5th Cir. 1995); *United States* v. *Crumby*, 895 F. Sup. 1354, 1360 (D. Ariz. 1995); *United States* v. *Galbreth*, supra, 908 F. Sup. 877; *United States* v. *Cordoba*, 104 F. Sup. 2d 1228, 1230 (D. Minn. 2000); *United States* v. *Ridling*, 350 F. Sup. 90, 92 (E.D. Va. 1972); *United States* v. *Wilson*, 361 F. Sup. 2d 1227, 1230 (D. Utah 2005

III

The defendant's final claim is that the right to compulsory process, as guaranteed under the sixth amendment to the United States constitution and as applied to the states through the fourteenth amendment to the United States constitution, and also as accorded by article first, § 8, of the Connecticut constitution,[77] guarantees him the right to present a defense, and that the exclusion of favorable polygraph results violates that right. Consequently, the defendant asserts that, at the very least, he was entitled to an evidentiary hearing regarding the reliability of the polygraph examination. We disagree.

Although an accused does, of course, have a federal constitutional right to present a defense, "the right to present relevant testimony is not without limitation." *Rock* v. *Arkansas*, 483 U.S. 44, 55, 107 S. Ct. 2704, 97 L. Ed. 2d 37 (1987);[78] *Montana* v. *Egelhoff*, U.S. , 116 S. Ct. 2013, 2017, 135 L. Ed. 2d 361 (1996) ("[t]he proposition that the Due Process Clause guarantees the right to introduce all relevant evidence is simply

indicates otherwise, as noted previously. The court also flatly denied that juries will be unduly influenced by polygraph evidence. Id. Although the court may be right on this point, the matter is not as clear as the opinion suggests.

[77] Because the defendant has failed to provide any independent analysis under the state constitution, we limit our review to the federal constitution. *State* v. *Dyson*, 238 Conn. 784, 794, 680 A.2d 1306 (1996); *State* v. *Barnes*, 232 Conn. 740, 744 n.4, 657 A.2d 611 (1995).

[78] Some authorities have argued that *Rock* provides a "strong constitutional impetus" for polygraph admission. J. McCall, supra, 1996 U. Ill. L. Rev. 407. We disagree. In *Rock*, the Supreme Court struck down Arkansas' per se ban on hypnotically refreshed testimony, concluding that such testimony could be reliable under certain conditions, and thus that a per se rule barring admission was unconstitutional. *Rock* v. *Arkansas*, supra, 483 U.S. 59–60, 62. *Rock* arose, however, in the context of a manslaughter case in which the defendant wished to testify on her own behalf. In reaching its conclusion, the court emphasized that Arkansas' rule had impermissibly infringed on the right "of a defendant to testify"; id., 62; that the "rule had a significant adverse effect on [the defendant's] ability to testify"; id., 57; and that no other state had a per se rule barring the hypnotically refreshed "testimony of a *defendant*." (Emphasis in original.) Id. By excluding polygraph evidence, we in no way restrict any defendant's right or ability to testify.

indefensible"); *Batick* v. *Seymour*, 186 Conn. 632, 637, 443 A.2d 471 (1982). "Rules for the admission and exclusion of evidence should be found offensive to notions of fundamental fairness embodied in the United States Constitution only when, (1) without a rational basis, they disadvantage the defendant more severely than they do the State, or (2) [they] arbitrarily exclude reliable defensive evidence without achieving a superior social benefit." *Perkins* v. *State*, 902 S.W.2d 88, 94 (Tex. App. 1995); see *Rock* v. *Arkansas*, supra, 53–56. As already discussed at length in this opinion, there is a very strong basis for excluding polygraph evidence, and such exclusion is not arbitrary given the polygraph test's demonstrated lack of probative value.[79]

Moreover, we agree with the Appellate Court that an evidentiary hearing in the present case would have been a "nugatory undertaking."[80] *State* v. *Porter*, supra, 39

[79] See also *Jackson* v. *Garrison*, 677 F.2d 371, 373 (4th Cir. 1981) ("[R]estrictions governing the admission of polygraph evidence are matter[s] of state law and procedure not involving federal constitutional issues. . . . The exclusion of polygraph evidence did not negate the fundamental fairness of the petitioner's trial or violate a specific constitutional right." [Citation omitted; internal quotation marks omitted.]).

[80] The dissent asserts that denying the defendant an evidentiary hearing on his polygraph evidence deprives him "of his constitutional right to present a defense, [and] also his right to be heard at a meaningful time and in a meaningful manner—both rights which . . . are at the core of due process under the federal and state constitutions." The flaw in this argument is its underlying premise that the defendant *could* make a showing, if a hearing were granted, that his polygraph evidence is admissible. For, as a matter of logic, there can be no constitutional right to an evidentiary hearing regarding evidence that, as a matter of law, is inadmissible. Cf. *State* v. *Coleman*, 41 Conn. App. 255, 262–64, 675 A.2d 887, cert. granted, 237 Conn. 931, 677 A.2d 1372 (1996). Given our conclusion that, as a matter of law, the prejudicial impact of polygraph evidence outweighs any possible probative value, we fail to see why the defendant is entitled to a hearing on this topic, or what function such a hearing could serve. In this connection, we simply disagree with the majority opinion in *United States* v. *Scheffer*, 44 M.J. 442 (C.M.A. 1996), on which the dissent herein relies, and agree with the dissent in *Scheffer* that the sixth amendment right to confrontation is not violated by a per se evidentiary rule barring the admissibility of polygraph evidence.

The dissent sets forth two scenarios to support its underlying position

Conn. App. 803. We have conducted our own thorough review of the literature and case law,[81] and are con-

that, despite the polygraph's questionable validity, we should abandon our per se rule against admitting polygraph evidence at trial. First, the dissent claims that minority criminal defendants are so disadvantaged by the problems attendant to cross-racial identifications that, essentially, it is only fair to allow these defendants to present exculpatory polygraph results. This court has specifically rejected the notion of special treatment for defendants in cross-racial identification situations, however, holding that the mere fact that a defendant is of a different race than a witness does not entitle the defendant to a special instruction on eyewitness identification at trial. *State* v. *Cerilli*, 222 Conn. 566, 571–72, 610 A.2d 1130 (1992). Similarly, the mere fact that a witness and a defendant may be of different races does not warrant admitting evidence that, whatever the races of the trial participants, is of very questionable probative value and is highly prejudicial.

The dissent also asserts that our per se exclusionary rule may lead to the death penalty being imposed on an innocent defendant. Due to the prejudicial nature of polygraph evidence and its lack of probative value, we have concluded that polygraph evidence is inadmissible in any judicial proceeding *which is subject to the rules of evidence*. It would make little sense to subject such proceedings—which are part of the trial process, even when they are conducted separately—to the minimal validity and great prejudice of polygraph evidence that we determine is inappropriate for the trial itself. As the dissent is well aware, however, the rules of evidence simply do not apply to the presentation of mitigating factors during the penalty phase of a capital case. See General Statutes § 53a-46a (c); see also *State* v. *Ross*, 230 Conn. 183, 268, 646 A.2d 1318 (1994), cert. denied, U.S. , 115 S. Ct. 1133, 130 L. Ed. 2d 1095 (1995) ("[o]n its face, [§ 53a-46a (c)] authorizes a judge presiding over a penalty hearing to exclude mitigating evidence *only* on the basis of a lack of relevancy" [emphasis in original]). Consequently, the per se rule that we articulate today is not a bar to the introduction of polygraph evidence during the penalty phase of a capital case pursuant to § 53a-46a (c). Cf. *State* v. *Bartholomew*, 101 Wash. 2d 631, 646, 683 P.2d 1079 (1984) (polygraph evidence admissible by defense at sentencing phase of capital case). Thus, with respect to court proceedings to which the rules of evidence do not apply, such as the sentencing phase of a capital case, or sentencing proceedings generally, we adopt no blanket rule regarding the admissibility of polygraph evidence, and leave that question to a case in which there has been a claim that the trial court has abused its discretion in either admitting or precluding such evidence.

Moreover, the dissenter's inference that we have "attempt[ed] to allay [his] concerns by suggesting that polygraph evidence is admissible" in the penalty phase of a capital case is misguided. We are not engaged in the process of "allaying" the dissenter's "concerns," nor do we endorse the judicial psychoanalysis by which he draws such an inference.

[81] See part II of this opinion.

vinced of the continued wisdom of our long established rule of polygraph inadmissibility. We acknowledge that several different polygraph testing techniques currently exist, and that lie detection technology continues to evolve.[32] If, at some future date, *substantial* evidence indicates that some polygraph or other lie detection technique has reached a sufficiently high level of validity that the probative value of such evidence potentially outweighs its prejudicial impact, we may be forced to revisit this issue. Until then, however, we see no pur-

[32] For example, we recognize that a modification of the control question test, the "directed lie control question test," has been developed over the past few years. Indeed, the results from the latter test have been admitted in at least one case. See *United States* v. *Galbreth*, supra, 908 F. Sup. 877. "The basic rationale of the [directed lie control question test] is similar to that of the [control question test]. Subjects are asked direct accusatory relevant questions. Physiological responses to the relevant questions are evaluated against the physiological response to comparison questions. However, in the [directed lie control question test] the comparison questions are known lies." C. Honts & B. Quick, supra, 71 N.D. L. Rev. 1001–1002. "[T]he subject [is] asked a question like, 'Before 1994, did you ever tell even one lie in your entire life?' . . . The subject [is then] instructed to answer this question on the test with a lie, and [is also] instructed to: think of a specific incident of lying and to pay close attention to his or her physiological responses. . . . Subjects are told that it is important that they respond appropriately when lying and that if they fail to do so the test will be inconclusive. . . ." (Citations omitted.) Id., 1002 n.93. "The rationale of the [directed lie control question test] predicts that guilty subjects will respond with greater physiological responses to the relevant questions while innocent subjects will respond with greater responses to the directed lie questions." Id., 1002.

The directed lie control question test has been praised both because it allows for standardization of the pretest interviews and control questions; id.; and because it is less intrusive than the traditional control question test. See *United States* v. *Galbreth*, supra, 908 F. Sup. 885. Moreover, such limited studies as have been conducted indicate that the directed lie control question test might produce somewhat fewer false positives than the traditional control question test. See, e.g., C. Honts & D. Raskin, "A Field Study of the Validity of the Directed Lie Control Question," 16 J. Police Sci. & Admin. 56, 60 (1988). Even if we concede, however, that the directed lie control question test is "slightly more accurate" than the control question test; C. Honts & B. Quick, supra, 71 N.D. L. Rev. 1002; all of the prejudicial effects of control question test evidence persist under the directed lie control question test, thereby justifying its exclusion.

pose in requiring the trial courts of this state to undertake evidentiary hearings every time a defendant proffers polygraph evidence.

The judgment of the Appellate Court is affirmed.

In this opinion CALLAHAN, C. J., and NORCOTT, KATZ, PALMER and MCDONALD, Js., concurred.

BERDON, J., concurring and dissenting. The court today retains a per se rule that bars from evidence the results of a polygraph test under any circumstances. This per se rule infringes on the defendant's constitutional right to present a defense. The significance—and indeed the absurdity—of this rule barring polygraph evidence under any circumstances is demonstrated by hypothesizing the following factual scenario. A defendant is accused of a capital felony subject to the death penalty and the only issue is one of identification—that is, whether he was incorrectly identified by a witness as the perpetrator of the crime. The defendant submits to a properly administered polygraph examination that indicates that he is telling the truth when he says that he did not kill the victim. He also submits to a polygraph examination administered by the state that confirms the truthfulness of his statement that he was not the perpetrator. Notwithstanding the results of these two polygraph tests, the state continues with its prosecution of the defendant because of the strong identification testimony of its sole eyewitness. The thought of executing a person found guilty under these circumstances would shock anyone's conscience,[1] whether the poly-

[1] The majority, in footnote 80, in response to my concerns about the execution of an innocent person, attempts to allay those concerns by suggesting that polygraph evidence is admissible before the jury in the penalty phase of a capital case. I am unable to understand how polygraph evidence could be sufficiently reliable for the jury to consider when determining whether a person should be executed or whether a person should spend the rest of his or her life confined in prison, but not sufficiently reliable for

graph is 91 percent or merely 59 percent accurate.[2] "The quintessential miscarriage of justice is the execution of a person who is entirely innocent." *Schlup* v. *Delo*, 513 U.S. 298, 324–25, 115 S. Ct. 851, 130 L. Ed. 2d 808 (1995). This per se rule of the court collides with the " 'fundamental value determination of our society,' given voice in Justice Harlan's concurrence in *Winship*, that 'it is far worse to convict an innocent man than to let a guilty man go free.' " *Francis* v. *Franklin*, 471 U.S. 307, 313, 105 S. Ct. 1965, 85 L. Ed. 2d 344 (1985), quoting *In re Winship*, 397 U.S. 358, 372, 90 S. Ct. 1068, 25 L. Ed. 2d 368 (1970) (Harlan, J., concurring). "[C]oncern about the injustice that results from the conviction of an innocent person has long been at the core of our criminal justice system." *Schlup* v. *Delo*, supra, 325.

Indeed, if the defendant in the present case was an African-American, as in the companion case,[3] and the case involved cross-racial identification,[4] not to allow

the purpose of determining guilt or innocence. The logic of the majority eludes me.

[1] See part IV of this opinion.

[2] See *State* v. *Hunter*, 241 Conn. 165, A.2d (1997).

[3] "It is well documented that cross-racial identification is less reliable than identification of one person by another of the same race. [C]onsiderable evidence indicates that people are poorer at identifying members of another race than of their own. . . . Moreover, counterintuitively, the ability to perceive the physical characteristics of a person from another racial group apparently does not improve significantly upon increased contact with other members of that race. Because many crimes are cross-racial, these factors may play an important role in reducing the accuracy of eyewitness perception. Note, 'Did Your Eyes Deceive You? Expert Psychological Testimony on the Unreliability of Eyewitness Identification,' 29 Stan. L. Rev. 969, 982 (1977). Elizabeth F. Loftus, in her classic treatise entitled 'Eyewitness Testimony,' wrote that [i]t seems to be a fact—it has been observed so many times—that people are better at recognizing faces of persons of their own race than a different race. E. Loftus, Eyewitness Testimony (1979) pp. 136–37. She concluded, on the basis of an examination of studies made on the subject, that [p]eople have greater difficulty in recognizing faces of another race than faces of their own race. Id., 139. *State* v. *Cerilli*, 222 Conn. 556, 586–89, 610 A.2d 1130 (1992) (*Berdon, J.*, dissenting).

"Concern for the problems of cross-racial identification is well docu-

the jury to consider the properly administered polygraph test results when considering the reliability of the identification of the accused is simply unacceptable, whether the accused's life is at stake or whether he faces the loss of his liberty. Furthermore, it is well known that the frailties of eyewitness identification are not limited to cross-racial identification.

In this case, the defendant sought a hearing before the trial court in order to demonstrate the validity of the polygraph test results he sought to introduce. The trial court, relying upon our failure to adopt *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993), for the admission of scientific evidence and assuming that we would continue to adhere to the antiquated rule of *Frye* v. *United*

mented in our case law as well as by other social scientists. We are painfully aware of miscarriages of justice caused by wrongful identification. Those experienced in criminal trial work or familiar with the administration of justice understand that one of the great problems of proof is posed by eyewitness identification, *especially in cross-racial identification* . . . . Judge Bazelon, dissenting in *United States* v. *Butler*, 636 F.2d 727 (D.C. Cir. 1980), cert. denied, 451 U.S. 1019, 101 S. Ct. 3010, 69 L. Ed. 2d 392 [1981], observed that many experts have concluded that convictions based solely on one eyewitness identification represent conceivably the greatest single threat to the achievement of our ideal that no innocent men shall be punished. . . . *Brown* v. *Davis*, 752 F.2d 1142, 1146 (6th Cir. 1985); see also *Kampshoff* v. *Smith*, 698 F.2d 581 (2d Cir. 1983). Another important factor to be considered in assessing the reliability of an identification is whether the witness and the person identified are of the same or different races. In general, there is a much greater possibility of error where the races are different than where they are the same. Where they are different, there is more likelihood of error where the suspect belongs to a minority group and the witness to a majority group than there is in the opposite situation. Almost fifty years ago, it was said to be: well known that, other things being equal, individuals of a given race are distinguishable from each other in proportion to our familiarity, to our contact with the race as a whole. Thus to the uninitiated American, all [Asians] look alike, while to the [Asian] all white men look alike. P. Wall, Eye-Witness Identification in Criminal Cases (2d Ed.) p. 122; A. Yarmey, The Psychology of Eyewitness Testimony (1979) pp. 130–31." (Emphasis in original; internal quotation marks omitted.) *State* v. *Reddick*, 224 Conn. 445, 471–72 n.1, 619 A.2d 453 (1993) (*Berdon, J.*, dissenting).

States, 293 F. 1013 (D.C. Cir. 1923), rejected the defendant's request for an evidentiary hearing. The trial court in the present case stated that it was "only a trial level court" and that an "appellate court [must] direct a trial court like this court to have [a] hearing."[3] Nevertheless, the defendant sought before the trial court the very procedure that we subsequently indicated should be followed in a recent opinion authored by Justice Borden in *State* v. *Esposito*, 235 Conn. 802, 832–33, 670 A.2d 301 (1996). In *Esposito*, we sent the strong message that in order "[t]o create a record sufficient to allow this court to consider altering the long-standing Connecticut law barring polygraph evidence, the defendant bore the burden of demonstrating that traditional reasons for the rule are no longer applicable. Even under the *Daubert* rule, the evidence must be shown to be relevant and reliable to be admissible. . . . *[T]he defendant bore the burden of creating a factual record before the trial court that the polygraph test possesses sufficient reliability to justify its introduction as scientific evidence.*" (Citation omitted; emphasis added.) Id.

The majority of this court, instead of predicating its decision on a factual record, today decides as a matter of law that the polygraph, under any circumstances, does not have sufficient validity for the results of the test to be admissible into evidence. There are two procedural problems underlying the majority's conclusion

[3] In groping for support for its position, the majority, quoting the Appellate Court out of context, claims at the end of its opinion that the Appellate Court had also concluded that a hearing on the admissibility of the polygraph evidence would be a "nugatory undertaking." What the Appellate Court held was that because of this court's precedent holding that polygraph evidence is inadmissible, a hearing on the validity of the polygraph examination would serve no purpose. *See State* v. *Porter*, 39 Conn. App. 800, 803, 668 A.2d 725 (1995) ("The trial court, like this court, is bound by the Connecticut precedent which bars the admission of polygraph results. . . . Because an evidentiary hearing would have been a nugatory undertaking, the trial court was not required to grant the defendant's motion for an evidentiary offer of proof." [Citation omitted.]).

that have constitutional implications. First, the defendant was never given an opportunity to either develop the factual basis for his claim, or, equally important, an opportunity to argue the validity of an appropriately administered polygraph. This court, on its own, contrary to *Daubert*, which we embrace today, delves into the literature on the subject and decides that the polygraph does not have a sufficiently high level of validity and, therefore, determines that its prejudicial impact outweighs its probative value. Second, we did not certify that issue on appeal from the Appellate Court. Rather, we certified two issues: (1) whether the defendant had the right to an evidentiary hearing, on the issue of whether the polygraph evidence was admissible; and (2) whether we should adopt *Daubert* for the admissibility of scientific evidence.[6] *State* v. *Porter*, 236 Conn. 908, 670 A.2d 1308 (1996). In view of the certified issues, neither the state nor the defendant addresses the validity and reliability of a properly administered polygraph examination. Without giving the defendant an opportunity to demonstrate the scientific underpinnings and the accuracy of the polygraph, this court not only deprives the defendant of his constitutional right to present a defense,[7] but also his right to be heard at a meaningful time and in a meaningful manner—both rights which, of course, are at the core of due process under the federal and state constitutions. *Armstrong* v. *Manzo*, 380 U.S. 545, 552, 85 S. Ct. 1187, 14 L. Ed. 2d 62 (1965); *Roundhouse Construction Corp.* v. *Telesco Masons Supplies Co.*, 168 Conn. 371, 385, 362 A.2d 778, vacated, 423 U.S. 809, 96 S. Ct. 20, 46 L. Ed. 2d 29 (1975), aff'd on remand, 170 Conn. 155, 365 A.2d 393, cert. denied, 429 U.S. 889, 97 S. Ct. 246, 50 L. Ed. 2d 172 (1976). Incredibly, not content to bar polygraph evidence from criminal trials, the court today in one sweep-

[6] See footnote 3 of the majority opinion.

[7] See part V of this opinion.

ing sentence in a footnote also adopts a per se rule excluding polygraph evidence in civil trials.[8]

I

First, it is important that the issues in this case be placed in the context of the evidence presented at the defendant's trial. The defendant was charged with arson for a fire that destroyed his home on July 20, 1992. The defendant and his wife had moved into their new residence in September, 1991, and had extensively renovated the house. During the defendant's trial, his wife testified that an area of the living room, which was identified as one of the sources of the fire, was primed and painted the day before the fire occurred. On the day of the fire, the defendant, his wife and their child smelled smoke and observed a haze in the house. The three of them then went to a neighbor's house across the street. The defendant returned to the family home and emptied a fire extinguisher on the electrical panel in the basement, the location from which the defendant observed smoke originating. The defendant then returned to the neighbor's house and telephoned his brother-in-law, a licensed electrician, for advice. A fire subsequently consumed the house.

The deputy fire marshall for the city of Norwich, who testified as a state's witness, was aware that there were items such as paint thinner, turpentine, aerosol cans, jelly substances and other flammable items used in the painting of the interior of the home during the time that the fire occurred. The deputy fire marshall testified that he found three points of origin of fire, but that he had no opinion as to the source of the *ignition* of the fire. He also testified that he never considered electrical arcing[9] as a potential source of ignition of the fire

[8] See footnote 36 of the majority opinion.

[9] An electrical arc is defined as "a sustained brilliantly luminous glow sometimes having the appearance of a curved line of flame that is formed under certain conditions when a break is made in an electric circuit." Web-

because no one communicated to him that there was such electrical arcing in the house. While the firefighters were tending to the fire, however, the electricity in the house was not shut off and other witnesses observed electrical arcing.

The deputy fire marshall identified a floor lamp, contained in a photograph admitted as a state's exhibit, that was near a couch located in one of the three points of origin of the fire. Although the fire marshall testified that electrical arcing can cause fires, he failed to have the lamp or the electrical outlet dismantled and tested in order to determine if either of those were the source of the ignition of the fire. Indeed, the defendant's attorney elicited testimony on cross-examination of the deputy fire marshall that the burn pattern on the lamp was inconsistent with his theory of where the fire started and that he had no explanation for such an inconsistency. In addition, he testified that if a fire is caused by an electrical arc, neither he nor any one else trained in the field of fire investigation would be able to determine the contact between an appliance and the fire.

At the trial, the defendant's homeowner's insurance agent indicated that the home was underinsured by approximately $48,000 at the time of the fire. The insur-

ster's Third New International Dictionary. One of the firefighters, a captain of the Yantic fire company, testified for the state at the defendant's trial and he described electrical arcing as "a bluish color, bluish white color that arcs and it sounds . . . like a popping crackling noise, followed by a blue and whitish color. . . . It's kind of like [the] sparkler you see at the 4th of July [that] the kids have." Regarding the general distance of an electrical arc, he testified that "if you're talking 110, 220 voltage in an average house as you have up there . . . it depends on what it's feeding, depends on how much of the line has been burnt, if you had a long electrical cord where the fire had melted the cord down and you put water on it, the whole thing could arc maybe six feet. It could be only two feet. It's very hard to tell." The same firefighter also testified that he did not see any electrical arcing while he was fighting the fire, but that, while at the scene of the fire, it was transmitted to him by portable radio that other firefighters had observed electrical arcing.

ance agent also testified that an increase in insurance was due to go into effect on August 30, 1992, one month and ten days after the fire. Previous to the fire, the home was evaluated by the insurance company to have been in excellent condition with many renovations having been made. The renovations included new kitchen cabinets, tiled bathrooms, electrical plugs and painted walls, and new carpeting was set to arrive a week after the fire occurred. A certified public accountant testified that the defendant and his wife were current with their bills and had even prepaid their mortgage at the time of the fire. The accountant also testified that the defendant and his wife had invested most of their life savings into the renovation of their home. There were no eyewitnesses to the start of the fire.

The defendant did not testify on his own behalf, but his sworn statement to the police, concerning the denial of his participation in setting the fire and the circumstances surrounding the fire, was introduced into evidence by the state. The defendant submitted to a polygraph examination on January 27, 1993, which was administered by Leighton R. Hammond,[10] a certified polygraphist and president of the Associated Detective Bureau, Inc. The defendant, well before the trial commenced, filed a pretrial motion to admit the results of a polygraph examination that he had taken. In the opinion of Hammond, the defendant was telling the truth when he answered that he neither set the fire nor knew if anyone else had purposely set the fire. Although there was sufficient time to order the defendant to submit to a polygraph examination from an expert retained by the state, as a condition for the admission of the defendant's

[10] At oral argument before the trial court regarding the defendant's motion to admit the results of his polygraph examination, the defendant's attorney represented to the trial court that Hammond works for fifty-three police departments and performs all of the polygraph testing for the Windsor police department.

polygraph test results, the trial court, after argument, denied the defendant's motion for a hearing regarding the admissibility of the polygraph examination. As evidenced by the above facts, the defendant's credibility was crucial to his defense in light of the fact that the state's case was paper-thin. Indeed, the jury agreed that the state failed to prove the fire was started by the defendant for the purpose of collecting insurance proceeds by finding him not guilty on the first count of the information, which alleged a violation of General Statutes § 53a-111 (a) (3).[11] Rather, the jury found him guilty on the second count of starting a fire under circumstances in which a firefighter was subjected to substantial risk of bodily injury in violation of § 53a-111 (a) (4).[12] The defendant was sentenced to imprisonment for a period of seventeen years, execution suspended after twelve years.

II

I agree with the majority that for the admissibility of scientific evidence we should abandon the *Frye* test and adopt the general principles of *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 579. Under *Daubert*, the scientific evidence need not be generally accepted by the scientific community; rather, the scientific evidence must be relevant and reliable. Id., 594–95. In *Daubert*, the court delineated certain considerations, although not an exhaustive checklist, in order to guide

[11] General Statutes § 53a-111 provides in relevant part: "Arson in the first degree: Class A felony. (a) A person is guilty of arson in the first degree when, with intent to destroy or damage a building, as defined in section 53a-100, he starts a fire or causes an explosion, and . . . (3) such fire or explosion was caused for the purpose of collecting insurance proceeds for the resultant loss . . . ."

[12] General Statutes § 53a-111 (a) provides in relevant part: "A person is guilty of arson in the first degree when, with intent to destroy or damage a building, as defined in section 53a-100, he starts a fire or causes an explosion, and . . . (4) at the scene of such fire or explosion a peace officer or firefighter is subjected to a substantial risk of bodily injury."

trial courts through their evaluation of the admissibility of scientific evidence: (1) whether the theory or technique can be, or has been, tested; (2) whether the theory or technique has been subjected to peer review and publication, although publication (which is one element of peer review) is not an indispensable condition; (3) the known or potential rate of error and the existence and maintenance of standards controlling the technique's operation; and (4) whether the theory or technique possesses general acceptance within the scientific community. Id., 592–95. The Supreme Court also stated that "[t]he inquiry . . . is, we emphasize, a flexible one. Its overarching subject is the scientific validity—and thus the evidentiary relevance and reliability—of the principles that underlie a proposed submission. The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate." Id., 594–95. If the trial court determines that the scientific evidence is relevant and reliable, then the *trial court* must determine whether to exclude the evidence because its probative value is substantially outweighed by its prejudicial effect, or whether the scientific evidence will confuse the issues or mislead the jury. Id., 595. In other words, as the majority states it, a trial judge should deem scientific evidence inadmissible "only when the methodology underlying such evidence is sufficiently invalid to render the evidence incapable of helping the fact finder determine a fact in dispute." In exercising this discretion, the trial court, however, must take into account the defendant's right to present a defense under the sixth amendment to the federal constitution and article first, § 8, of the state constitution.[13]

Our conclusion today that *Daubert* is the correct standard for determining the admissibility of scientific evidence requires, as I shall subsequently point out, that

[13] See part V of this opinion.

trial courts determine on a case-by-case basis whether polygraph evidence is admissible. Indeed, the *Daubert* standard will have the salutary effect of opening the door to a new vista of scientific evidence in order to achieve justice.[14]

III

In my view, there is substantial authority that would at least justify affording the defendant an opportunity to have a hearing regarding the admissibility of the polygraph evidence. In *United States* v. *Piccinonna*, 885 F.2d 1529 (11th Cir. 1989), the Court of Appeals for the Eleventh Circuit, sitting en banc, abandoned the per se exclusionary rule regarding polygraph evidence, even before *Daubert* was decided.[15] "Since the *Frye* decision, tremendous advances have been made in polygraph instrumentation and technique.[16] Better equip-

[14] See footnote 4 of this opinion with respect to identification evidence. In *United States* v. *Amador-Galvan*, 9 F.3d 1414, 1417–18 (9th Cir. 1993), the court held that *Daubert* overruled a per se rule excluding expert testimony regarding the credibility of eyewitness identification. See also *United States* v. *Cordoba*, 104 F.3d 225, 227 (9th Cir. 1997) (applying reasoning in *Amador-Galvan* to polygraph evidence and holding that per se rule was overruled by *Daubert*).

[15] The court in *Piccinonna* established certain conditions, as we should, for the admissibility of polygraph evidence. Besides allowing polygraph results to be admitted based on a stipulation, the court in *Piccinonna* outlined that this evidence is admissible to impeach or corroborate the testimony of a witness if: (1) the party planning to use the polygraph evidence provides adequate notice to the opposing party that the expert testimony will be offered; (2) the opposing party must be given a reasonable opportunity to have its own polygraph examiner administer a test covering substantially the same questions; and (3) any relevant requirements of the Federal Rules of Evidence must be followed—for instance, evidence that a witness passed a polygraph examination cannot be used to corroborate that witness' testimony until after the credibility of that witness has been attacked. *United States* v. *Piccinonna*, supra, 885 F.2d 1536. "Even where the above three conditions are met, admission of polygraph evidence for impeachment or corroboration purposes is left entirely to the discretion of the trial judge." Id.

[16] "The instrument used in *Frye* measured only one physiological response (blood pressure), whereas the modern polygraph measures respiration and galvanic skin resistance in addition to blood pressure. The technique also

ment is being used by more adequately trained polygraph administrators. Further, polygraph tests are used extensively by government agencies. Field investigative agencies such as the FBI, the Secret Service, military intelligence and law enforcement agencies use the polygraph. Thus, even under a strict adherence to the traditional *Frye* standard, we believe it is no longer accurate to state *categorically* that polygraph testing lacks general acceptance for use in all circumstances. For this reason, we find it appropriate to *reexamine the per se exclusionary rule and institute a [new] rule more in keeping with the progress made in the polygraph field.*" (Emphasis added.) Id., 1532.

"There is no question that in recent years polygraph testing has gained increasingly widespread acceptance as a useful and reliable scientific tool. Because of the advances that have been achieved in the field which have led to the greater use of the polygraph examination, coupled with a lack of evidence that juries are unduly swayed by polygraph evidence, we agree with those courts which have found that a per se rule disallowing polygraph evidence is no longer warranted. Of course, polygraphy is a developing and inexact science, and we continue to believe it inappropriate to allow the admission of polygraph evidence in all situations in which more proven types of expert testimony are allowed. However, as Justice Potter Stewart wrote, '*any rule that impedes the discovery of truth in a court of law impedes as well the doing of justice.*' *Hawkins* v. *United States*, 358 U.S. 74, 81, 79 S. Ct. 136, 140, 3 L. Ed. 2d 125 (1958) [Stewart, J., concurring]. Thus, we believe the best approach in this area is one which balances the need to admit all relevant and reliable evidence against the danger that the admission of the

has been improved through the development of control questions, the pretest interview, and simulation methods." 1 P. Giannelli & E. Imwinkelried, Scientific Evidence (2d Ed. 1993) § 8-3, p. 231 n.75.

evidence for a given purpose will be unfairly prejudicial." (Emphasis added.) *United States* v. *Piccinonna*, supra, 885 F.2d 1535.

Indeed, in a recent unanimous decision, the Court of Appeals for the Ninth Circuit abandoned the per se rule against the admissibility of polygraph evidence. "*Daubert* holds that it is the trial judge's task, rather than [an appellate court's task], to conduct the initial weighing of probative value against prejudicial effect. Accordingly, we hold that *Daubert* also overruled any per se rule [in the Ninth Circuit] that unstipulated polygraph evidence is always inadmissible under Rule 403 [of the Federal Rules of Evidence].[17] Requiring the trial judge to conduct the Rule 403 analysis is consistent with the law of other circuits." *United States* v. *Cordoba*, 104 F.3d 225, 228 (9th Cir. 1997); see *United States* v. *Posado*, 57 F.3d 428, 433–34 (5th Cir. 1995) ("After *Daubert*, a per se rule is not viable. . . . Remaining controversy about test accuracy is almost unanimously attributed to variations in the integrity of the testing environment and the qualifications of the examiner. . . . We merely remove the obstacle of the per se rule against admissibility, which was based on antiquated concepts about the technical ability of the polygraph and legal precepts that have been expressly overruled by the Supreme Court." [Citations omitted.]);[18] see also *United States* v. *Pettigrew*, 77 F.3d 1500 (5th Cir. 1996) (reaffirming elimination of per se rule in *Posado*); *United States* v. *Pulido*, 69 F.3d 192, 205 (7th Cir. 1995)

[17] Rule 403 of the Federal Rules of Evidence provides: "Exclusion of Relevant Evidence on Grounds of Prejudice, Confusion, or Waste of Time

"Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence."

[18] In *Posado*, even the government conceded that the per se rule against admitting polygraph evidence was "no longer viable after *Daubert*." *United States* v. *Posado*, supra, 57 F.3d 432.

BEST AVAILA

("[t]his court has persistently refused to adopt [a per se rule against admissibility of polygraphs], choosing rather to leave the decision on admissibility to the sound discretion of the district court" [internal quotation marks omitted]); *United States* v. *Sherlin*, 67 F.3d 1208 (6th Cir. 1995) (acknowledging *Daubert* as standard for admissibility of polygraph evidence but holding that decision to exclude polygraph evidence rests within sound discretion of District Court); *McMorris* v. *Israel*, 643 F.2d 458 (7th Cir. 1981), cert. denied, 455 U.S. 967, 102 S. Ct. 1479, 71 L. Ed. 2d 684 (1982) (refusal of prosecutor to give reasons for not entering into stipulation regarding admissibility of polygraph test results in state court prosecution was violation of defendant's due process rights); *United States* v. *Galbreth*, 908 F. Sup. 877 (D.N.M. 1995) (admitting polygraph evidence, although Tenth Circuit cases prior to *Daubert* held that polygraph evidence is inadmissible); *Ulmer* v. *State Farm Fire & Casualty Co.*, 897 F. Sup. 299 (D. La. 1995) (admitting polygraph evidence after finding that *Daubert* must be applied); *United States* v. *Crumby*, 895 F. Sup. 1354 (D. Ariz. 1995) (accepting *Daubert* as proper standard for admissibility of polygraph evidence and allowing admission of polygraph evidence under certain conditions); *United States* v. *Lech*, 895 F. Sup. 582 (S.D.N.Y. 1995) (assuming that *Daubert* applies to polygraph evidence but holding under facts of case that evidence not admissible); *United States* v. *Scheffer*, 44 M.J. 442, 445–46 (C.M.A. 1996) (holding that military rule of evidence excluding polygraph evidence, under the circumstances of that case, violated defendant's sixth amendment right to present a defense);[19] *United States* v. *Mobley*, 44 M.J. 453, 454–45 (C.M.A. 1996) (same, companion case to *Scheffer*).

In addition, it appears that the Court of Appeals for the Second Circuit has signalled that it is ready to con-

[19] See part V of this opinion.

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sider the admissibility of polygraph evidence under *Daubert*. See *United States* v. *Kwong*, 69 F.3d 663, 669 (2d Cir. 1995) ("[t]he record before us simply does not provide the proper opportunity to explore the validity of polygraph evidence"). Likewise, the Court of Appeals for the Fourth Circuit has indicated that it is ready to reconsider the admissibility of polygraph evidence; see *United States* v. *Toth*, 91 F.3d 136 (4th Cir. 1996) (decided without published opinion), No. 95-5191, 1996 U.S. App. LEXIS 19017, *12–14 (implying that, in appropriate case, polygraph evidence will be reconsidered in light of *Daubert*, Fifth Circuit's decision in *Posado*, and Eleventh Circuit's decision in *Piccinonna*); and the Eighth Circuit has also implied that it will reconsider the admissibility of polygraph evidence. See *United States* v. *Williams*, 95 F.3d 723, 728–30 (8th Cir. 1996) (implying that nonstipulated polygraph evidence may be admissible under *Daubert*, but that District Court has discretion to exclude the evidence under rule 403).[20]

The only federal circuit in which the Court of Appeals, or the district courts within the circuit, have not abrogated or rejected a per se rule is the Court of Appeals for the District of Columbia Circuit. *United States* v. *Skeens*, 494 F.2d 1050, 1053 (D.C. Cir. 1974). The decision in *Skeens*, however, dates back to 1974, more than eighteen years before *Daubert*, and that, of course, was the Circuit Court of Appeals that originally promulgated the *Frye* test back in 1923. See id., 1053 ("The leading case in this Circuit [regarding the admissibility of polygraph tests] is *Frye*. . . . This case has been followed uniformly in this and other Circuits and there has never been any successful challenge to it in any federal court." [Citation omitted.]). In addition, the First Circuit, in *United States* v. *Black*, 78 F.3d 1, 7 (1st Cir. 1996), stated that "the results of polygraph examinations are *generally* inadmissible . . . ." (Citation omitted; emphasis added.)

[20] The Eighth Circuit also allows stipulated polygraph evidence.

This appears not to be a per se rule, but, notwithstanding, *Black* relied on a Sixth Circuit case for the proposition that polygraph test results are generally inadmissible. See id., citing *United States* v. *Scarborough*, 43 F.3d 1021, 1026 (6th Cir. 1994). Even the Sixth Circuit, however, as noted previously, no longer follows that rule. *United States* v. *Shertin*, supra, 67 F.3d 1216–17.

Thus, six federal Circuit Courts of Appeals (Fifth, Sixth, Seventh, Ninth, Eleventh and the Court of Appeals for the Armed Forces) and federal district courts in two other circuits (Second and Tenth) no longer apply a per se rule excluding polygraph evidence; three federal Circuit Courts of Appeals (Second, Fourth and Eighth) have either indicated a willingness to review the admissibility in a proper case or implicitly indicated that it was admissible. The Court of Appeals for the Third Circuit has not addressed the issue of polygraph admissibility. As the Court of Appeals for the Fourth Circuit just recently pointed out, "circuits that have not yet permitted evidence of polygraph results for any purpose are now in the decided minority." (Internal quotation marks omitted.) *United States* v. *Toth*, supra, 1996 U.S. App. LEXIS 19017, *13.[21]

In addition, state courts[22] have ruled that polygraph evidence is admissible in varying situations. See, e.g.,

[21] I have two observations with respect to the case law that the majority relies upon. First, with respect to the state jurisdictions, the vast number of the cases were decided before *Daubert*. Second, the majority downplays how the federal courts have dealt with *Daubert* in the context of polygraph evidence. Although the majority today embraces *Daubert*, it chooses to ignore the wave of compelling federal precedent, following in the wake of *Daubert*, holding that the admissibility of polygraph evidence must be decided by *trial courts* on a case-by-case basis.

[22] At one time, Massachusetts admitted polygraph evidence without stipulation. *Commonwealth* v. *A Juvenile*, 365 Mass. 421, 425–26, 313 N.E.2d 120 (1974). In 1989, however, the Supreme Judicial Court of Massachusetts abandoned the position it had adopted in that case and ruled polygraph evidence inadmissible in criminal trials. *Commonwealth* v. *Mendes*, 406 Mass. 201, 212, 547 N.E.2d 35 (1989). In the dissenting opinion in *Mendes*,

State v. *Catanese*, 368 So. 2d 975, 981–83 (La. 1979) (polygraph evidence admissible in posttrial, and possibly pretrial, proceedings); *Conner* v. *State*, 632 So. 2d 1239, 1257–59 (Miss. 1993) (evidence of willingness to take polygraph examination admissible to rehabilitate impeached witness' credibility); *State* v. *Sanders*, 117 N.M. 452, 872 P.2d 870, 877 (1994) (polygraph evidence admissible under state rules of evidence previously enacted by state Supreme Court);[23] *State* v. *Wright*, S.C. , 471 S.E.2d 700, 701 (1996) ("[t]he admission of evidence in a criminal prosecution is within the discretion of the trial judge and his ruling will not be

Chief Justice Liacos stated that "[t]he court today rushes headlong into the wholesale rejection of a carefully crafted set of rules in this Commonwealth governing the admissibility of polygraph evidence." Id., 212. He further stated that "[w]ith proper oversight and the appropriate use of judicial discretion by trial judges, the polygraph can serve as an effective tool in the truth-seeking process." Id., 216 (Liacos, C. J., dissenting).

[23] "Of the state jurisdictions, New Mexico has gone the furthest in admitting polygraph evidence. In *State* v. *Dorsey*, [88 N.M. 184, 539 P.2d 204 (1975)] the New Mexico Supreme Court held that polygraph results were admissible if (1) the operator is qualified; (2) the testing procedures were reliable; and (3) the test of the particular subject was valid. [Id., 184–85.]" P. Giannelli, "Forensic Science: Polygraph Evidence: Part II," 30 Crim. L. Bull. 366, 373 (1994). "Several subsequent New Mexico appellate decisions have addressed procedural details flowing from the general admission authorized in *Dorsey*. . . . These holdings were incorporated in New Mexico Rule of Evidence 11-707, a comprehensive polygraph examination rule adopted by the Supreme Court of New Mexico in 1983." (Citations omitted.) J. McCall, "Misconceptions and Reevaluation—Polygraph Admissibility after *Rock* and *Daubert*," 1996 U. Ill. L. Rev. 363, 386 (1996).

"The rule changed the prior law in New Mexico by limiting admission of polygraphs to purposes of impeaching or corroborating the testimony of a witness, and by requiring thirty-day written notice of a party's intention to offer polygraph evidence at trial. Additionally, the following features of the rule set out clear cut solutions to four major concerns about the admission of polygraph results: a set of minimum qualifications a polygrapher must meet to give testimony about a polygraph test result in a New Mexico court, a recording requirement for all aspects of the polygraph examination, a prohibition on compelling any witness to take a polygraph examination, and a set of protocol requirements for a polygraph examination that must be followed if the results of the test are to be admitted in New Mexico courts." Id., 387–88.

disturbed on appeal unless abuse of discretion is shown"). Finally, many other jurisdictions allow polygraph evidence when its admissibility is stipulated to in advance by the defendant and the state.[21]

IV

The majority acknowledges—by way of an assumption—that polygraph evidence "may have enough demonstrated validity to pass the *Daubert* threshold for admissibility." The majority then illogically decides, as a matter of law, that the prejudicial impact outweighs its probative value. Notwithstanding our adoption of *Daubert* in this case, the majority then completely ignores the underpinnings of *Daubert*. In *Daubert*, the United States Supreme Court held: "Faced with a proffer of expert scientific testimony . . . the *trial judge must determine at the outset* . . . whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue." (Citation omitted; emphasis added.) *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 592; see also *United States* v. *Cordoba*, supra, 104 F.3d 228 (pursuant to *Daubert*, it is the trial judge's task, rather than an appellate level court's task, to weigh the probative value against prejudicial effect).

Although the determination of the admissibility of scientific evidence in the first instance is a question for the trial court, I must comment on the majority's *finding* that, as a matter of law, the prejudice of polygraph evidence outweighs its probative value. Applying our general standard for the admissibility of evidence—whether the prejudicial impact outweighs its probative value—the majority concludes that polygraph evidence is more prejudicial for essentially three reasons: (1) it lacks accuracy and, therefore, is of limited probative value; (2) it is time-consuming; and (3) it

[21] See footnote 69 of the majority opinion.

invades the jury's fact-finding mission. I find none of these reasons sufficient to support a rule that directs our trial courts to omit polygraph evidence under all circumstances, in civil as well as criminal trials, regardless of whether the omission is stipulated to in advance by both the state and the defendant in a criminal case[25] or by the plaintiff and the defendant in a civil case.

First, as to its accuracy, the courts and the literature have indicated that a properly administered polygraph examination is quite accurate. In fact, the majority concedes that there are impressive statistics as to its accuracy, based upon a very recent study. The majority opinion indicates that David Raskin, a noted authority, reviewed laboratory studies (simulated studies) that indicate that the polygraph has an 89 percent sensitivity rate (correctly labels a deceptive subject as being deceptive 89 percent of the time) and 91 percent specificity rate (correctly labels a truthful subject as being truthful 91 percent of the time), whereas the field studies (based on data from polygraph examiners in actual criminal cases) indicate that the polygraph has an 87 percent sensitivity rate and 59 percent specificity rate.[26] D. Raskin, "The Scientific Status of Research on Polygraph Techniques," in West Companion to Scientific Evidence 2 (Faigman et al. eds., forthcoming 1996), cited in C. Honts & B. Quick, "The Polygraph in 1995: Progress in Science and the Law," 71 N.D. L. Rev. 987, 995, 1018-19 (1995); see also D. Raskin, "Hoffmann, Hypnosis, and the Polygraph," 3 Utah B.J. 7, 8 (1990) ("[E]xtensive scientific data have clearly demonstrated that polygraph examinations that are properly conducted in appropriate situations have an accuracy rate that exceeds 90 percent . . . . Major advances in instrumentation, improvements in examination procedures, and our development of computerized methods

[25] See part II C of the majority opinion.

[26] See part II B 2 a of the majority opinion.

for interpreting the outcome of polygraph tests . . . have produced accuracy rates of approximately 95 percent in federal criminal investigations . . . ." [Citations omitted.]); A. Moenssens, F. Inbau & J. Starrs, Scientific Evidence in Criminal Cases (3d Ed. 1986) § 14.09, p. 712 ("when the technique is properly applied by a trained, competent examiner, it is very accurate in its indications, with a known error percentage of less than one percent"); D. Raskin, "The Polygraph in 1986: Scientific, Professional and Legal Issues Surrounding Application and Acceptance of Polygraph Evidence," 1986 Utah L. Rev. 29, 72 (1986) ("[t]he existing literature suggests an accuracy of 90 [percent] or higher when examinations are conducted to assess the credibility of suspects in criminal investigations and other specific incidents"). In addition to Raskin's most recent study, the majority also concedes that "other studies indicate higher levels of accuracy," citing generally to P. Giannelli, "Forensic Science: Polygraph Evidence: Part I," 30 Crim. L. Bull. 262, 271–73 (1994), and 1 C. McCormick, Evidence (4th Ed. 1992) § 206, pp. 909–10.[37]

[37] The majority, in part II B 2 b of its opinion, discusses "predictive values" based on the polygraph's sensitivity and specificity. Based upon Raskin's most recent field-derived figures of 87 percent sensitivity and 59 percent specificity, the majority calculates that "we should only be 68 percent confident that a subject really is lying if the subject fails a polygraph exam, and only 82 percent confident that the subject is being truthful if the subject passes." Using only Raskin's laboratory-derived figures, the majority calculates even higher "predictive values."

In the present case, using the majority's figures, *we can be 82 percent confident that the defendant was being truthful when he passed his polygraph examination*, an examination where he was asked whether he set fire to his house or if he knew if anyone else had purposely set the fire. See part I of this opinion. With this high degree of certainty, not to allow this evidence is simply unconscionable.

With respect to the truth-seeking ability of the polygraph, I find the "predictive value" percentages calculated by the majority compelling enough to show that a per se rule is unwarranted, especially in light of the significant debate about the accuracy of the polygraph. The trial courts in the first instance must conduct case-specific inquiries regarding offered polygraph evidence, in order to screen out incompetent polygraph practitioners and

In concluding that the traditional reasons for the per se rule are unpersuasive, one commentator has stated: "The most frequently mentioned [criticism] is that the technique is 'unreliable' due to inherent failings, a shortage of qualified operators,[28] and the prospect that 'coaching' and practicing would become commonplace if the evidence were generally admissible. Yet, by themselves, such doubts are not sufficient to warrant a rigid exclusionary rule. A great deal of lay testimony routinely admitted is at least as unreliable and inaccurate, and other forms of scientific evidence involve risks of instrumental or judgmental error." 1 C. McCormick, supra, § 206, pp. 914–15. Indeed, with respect to psychiatric testimony used to predict a defendant's future potential for dangerous behavior, the United States

improperly conducted polygraph examinations. See footnotes 15, 23 and 28 of this opinion. As the Fifth Circuit Court of Appeals aptly stated, "[r]emaining controversy about test accuracy is almost unanimously attributed to variations in the integrity of the testing environment and the qualifications of the examiner." *United States* v. *Posado*, supra, 57 F.3d 434.

[28] Many of the arguments against the admissibility of polygraph evidence center around undesirable and incompetent examiner practices. "Polygraph examiners in the United States, as a whole, are poorly trained. Their techniques lack standardization, and polygraph tests are subject to manipulation by unethical examiners. Given this state of affairs, the probative value of the work-product of most of the polygraph professionals should rightly be questioned. . . . [M]any of the problems associated with examiner practices could be exposed and/or controlled by an evidentiary requirement that all polygraph tests offered for admission be tape recorded in their entirety. However, to date only New Mexico has taken this step to assure the quality of polygraph tests offered for evidence. Problems of attorneys shopping for a particular test outcome could be controlled by an evidentiary requirement that if one test is offered, all polygraph tests conducted on a particular subject must be disclosed. Again, only New Mexico has taken this simple and seemingly logical step." C. Honts & M. Perry, "Polygraph Admissibility: Changes and Challenges," 16 Law & Hum. Behav. 357, 375–76 (1992).

"The wealth of examples provided by actual cases shows that a great deal of questionable evidence is produced by incompetent, poorly trained and unethical polygraph examiners. . . . To reduce these problems, the court could appoint polygraph experts after consultation with all parties. That would minimize the pressures placed on experts hired by one party and maximize the likelihood of screening out so-called experts who are incompetent or lack integrity." D. Raskin, supra, 1986 Utah L. Rev. 71.

Supreme Court has stated, despite the unanimous expert opinion that such conclusions were accurate only one out of three times; *Barefoot* v. *Estelle*, 463 U.S. 880, 920–22, 103 S. Ct. 3383, 77 L. Ed. 2d 1090 (1983) (Blackmun, J., dissenting); that "[a]ll of these professional doubts about the usefulness of psychiatric predictions can be called to the attention of the jury. Petitioner's entire argument, as well as that of Justice Blackmun's dissent, is founded on the premise that a jury will not be able to separate the wheat from the chaff. We do not share in this low evaluation of the adversary process." Id., 899–901 n.7.

Second, the claims that it will be time-consuming for our courts can be disposed of in short shrift. The need to conserve precious court time pales in significance when a person's liberty or life is at stake.[29] Surely, we cannot be that callous to a person who may be innocent. Any problems with polygraph evidence can be overcome through rules developed by this court regarding its admissibility, the availability of a polygraph examination conducted by the state, cross-examination and jury instructions.[30]

[29] The United States Court of Appeals for the Armed Forces answered the "floodgate" argument that their decision regarding polygraph evidence would generate an unreasonable burden on the military courts as follows: "Apart from the speculative nature of such an argument, we think that it is just as likely that polygraph evidence will prevent needless litigation by avoiding some meritless prosecutions as well as smoking out bogus [defenses]. . . . [O]ur measure should be the scales of justice, not the cash register." *United States* v. *Scheffer*, supra, 44 M.J. 448.

[30] The United States Supreme Court, in *Daubert*, rejected an argument that the abandonment of the "general acceptance" standard for the admissibility of scientific evidence will "result in a 'free-for-all' in which befuddled juries are confounded by absurd and irrational pseudoscientific assertions. [*This argument is*] *overly pessimistic about the capabilities of the jury and of the adversary system generally.* Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." (Emphasis added.) *Daubert* v. *Merrell Dow Pharmaceuticals, Inc.*, supra, 509 U.S. 595–96.

The greatest tragedy in our judicial system, with all its fallibility and misidentifications, would be to take away the life or liberty of one innocent person for the sake of preventing guilty persons from escaping punishment. See 4 W. Blackstone, Commentaries on the Laws of England (1769) c. 27, p. 352 ("it is better that ten guilty persons escape, than that one innocent suffer").

Finally, the majority curiously rejects polygraph evidence on the ground that it invades the fact-finding province of the jury. There are three answers to that argument. First, any reliable device that can aid the jury in its truth seeking mission should be available under rules and standards set forth by this court. As stated by the United States Court of Appeals for the

Arguments that polygraph evidence tends to mislead or confuse the jury are generally not supported in the literature. "Studies tend to show that juries are more inclined not to give extraordinary weight to polygraph evidence. Field and laboratory studies have consistently supported the notion that juries are capable of weighing and evaluating all evidence and rendering verdicts that may be inconsistent with polygraph results . . . .

"Several theories exist as to why polygraph evidence doesn't mislead or confuse a jury: jurors distrust scientific evidence, cross-examination brings out the weaknesses in polygraph evidence giving jurors the ability to give polygraph tests . . . the weight they are due, or there may be other significant evidence to support either a conviction or acquittal (or finding for [the] plaintiff or [the] defendant in a civil action) that simply outweighs the impact of the polygraph evidence . . . . Despite the logic and research to support these theories, none seem sufficient to persuade many courts from what appears to be a disparaging, and somewhat condescending, perspective of the abilities of American juries." C. Honts & M. Perry, "Polygraph Admissibility: Changes and Challenges," 16 Law & Hum. Behav. 357, 366–67 (1992); see also D. Raskin, supra, 1986 Utah L. Rev. 66 ("The available [empirical] evidence indicates that testimony by polygraph experts has no detrimental effects on the trial process, nor does it have an undue influence on the trier of fact. Since 1975 New Mexico has admitted polygraph evidence without a stipulation between the parties. Ten years of experience [1975 to 1985] has failed to reveal any inherent problems with that type of evidence."); R. Peters, "A Survey of Polygraph Evidence in Criminal Trials," 68 A.B.A. J. 162, 165 (1982) (on basis of empirical study conducted in Wisconsin, one commentator has indicated that "[t]he actual trial results clearly support the belief that juries are capable of weighing and evaluating all evidence and rendering verdicts that may be inconsistent with the polygraph evidence").

Armed Forces: "We believe that the truth-seeking function is best served by keeping the door open to scientific advances." *United States* v. *Scheffer*, supra, 44 M.J. 446. Second, as we approach the twenty-first century, "science, for better or for worse, has become more a part of our daily lives. Scientific evidence, in turn, has become more a part of the ordinary trial so that jurors may be more likely to use polygraph evidence with discretion." *McMorris* v. *Israel*, supra, 643 F.2d 462. Third, we allow the prosecution to introduce expert testimony, which is far less reliable than the polygraph, to bolster the credibility of the state's case in other situations. See, e.g., *State* v. *Ali*, 233 Conn. 403, 432, 660 A.2d 337 (1995) (expert allowed to testify as to typical behavior patterns of victims of sexual assault); *State* v. *Freeney*, 228 Conn. 582, 592, 637 A.2d 1088 (1994) (same); *State* v. *Borrelli*, supra, 227 Conn. 173–74 (expert allowed to testify as to typical behavior patterns of victims of battered women's syndrome); *State* v. *Spigarolo*, 210 Conn. 359, 378–79, 556 A.2d 112, cert. denied, 493 U.S. 933, 110 S. Ct. 322, 107 L. Ed. 2d 312 (1989) (expert allowed to testify that it is not unusual for child sexual abuse victim to give inconsistent or incomplete statements).

Indeed, this court recently allowed expert testimony to bolster the testimony of a child sexual abuse victim where there was a prolonged delay in the disclosure of the abuse to the authorities. See *State* v. *Christiano*, 228 Conn. 456, 459–63, 637 A.2d 382, cert. denied, 513 U.S. 821, 115 S. Ct. 83, 130 L. Ed. 2d 36 (1994). In fact, in the court's opinion in that case, authored by Justice Borden, we observed that "[t]he admissibility of opinion testimony of expert witnesses is a matter within the discretion of the trial court. . . . Generally, expert testimony is admissible if (1) the witness has a special skill or knowledge directly applicable to a matter in issue, (2) that skill or knowledge is not common to the average person, and (3) the testimony would be helpful to the

court or jury in considering the issues." (Citation omitted; internal quotation marks omitted.) Id., 461.

Although some of the previously noted cases can be distinguished because the expert testimony was admitted for the purpose of establishing the behavior patterns of the victims, I see little difference in the distinction. Nevertheless, that distinction has little substance because in those situations the evidence is submitted to bolster the credibility of the state's case, the state's witness, or both.

V

Finally, by not allowing the defendant an opportunity to have a hearing before the trial court in order to demonstrate the reliability of the polygraph evidence, he is deprived of his right to present a defense under the sixth amendment to the federal constitution and article first, § 8, of the state constitution.[31] The United States Supreme Court has made it clear that the right of an accused to present testimony that is relevant and material may not be denied arbitrarily. *Washington* v. *Texas*, 388 U.S. 14, 23, 87 S. Ct. 1920, 18 L. Ed. 2d 1019 (1967).

In *Rock* v. *Arkansas*, 483 U.S. 44, 107 S. Ct. 2704, 97 L. Ed. 2d 37 (1987), the United States Supreme Court reversed the conviction of a defendant by holding that her sixth amendment right under the federal constitution was violated when she was deprived of the right

[31] The illogic of the majority's opinion is highlighted in its response to this concurring and dissenting opinion, where the majority indicates that a per se rule does not violate a defendant's constitutional right to present a defense. The majority states that "as a matter of logic, there can be no constitutional right to an evidentiary hearing regarding evidence that, as a matter of law, is inadmissible." See footnote 80 of the majority opinion. In other words, based on the majority's circular reasoning, the defendant's right to present a defense can be subverted merely by the court deciding, as a matter of state law, that exculpatory evidence is not admissible. Not only is that reasoning illogical, it is also devious.

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to call herself as a wit[redacted] testify on her own behalf, regardless of the fact t[redacted]e needed to be hypnotically refreshed and the sta[redacted]law did not allow this form of testimony. "*A State's legitimate interest in barring unreliable evidence do[redacted]not extend to per se exclusions that may be reliable [redacted]an individual case.* . . . The State would be well w[redacted]hin its powers if it established guidelines to aid trial courts in the evaluation of post-hypnosis testimony and it may be able to show that testimony in a particular case is so unreliable that exclusion is justified." (Emphasis added.) Id., 61. "Despite the unreliability that hypnosis concededly may introduce . . . the procedure has been credited as instrumental in obtaining investigative leads or identifications that were later confirmed by independent evidence. . . . The inaccuracies the process introduces can be reduced, although perhaps not eliminated, by the use of procedural safeguards." (Citations omitted.) Id., 60.[32]

On the basis of *Rock*, one commentator has pointed out that a per se exclusionary rule regarding polygraph evidence violates a defendant's constitutional right to present a defense. "A recent [United States] Supreme Court interpretation of the constitutional right of a defendant in a criminal prosecution to call witnesses to testify in his or her behalf requires a reconsideration of the denial position when a criminal defendant attempts to introduce exculpatory polygraph evidence. Beginning with its earlier opinions in *Chambers* v. *Mississippi* [410 U.S. 284, 93 S. Ct. 1038, 35 L. Ed. 2d 297 (1973)] and *Green* v. *Georgia*, [442 U.S. 95, 99 S. Ct.

[32] Some of the procedural safeguards for the admission of hypnotically refreshed testimony are: (1) a qualified person performed the hypnosis; (2) an audiotape or videotape was made before, during and after the hypnosis was conducted; (3) cross-examination to reveal inconsistencies is allowed; and (4) the jury is educated about the risks of hypnotically refreshed testimony through the use of opposing expert testimony and cautionary instructions. *Rock* v. *Arkansas*, supra, 483 U.S. 60–61. These same safeguards, among others, can be used in the admission of polygraph testimony.

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2150, 60 L. Ed. 2d 738 (1979)] the Supreme Court started the development of a constitutional right to introduce exculpatory evidence in criminal trials. The Court's 1987 opinion in [*Rock*] established the basic components of that right. . . . The Court stated in dicta that reasonable restrictions on the right to call a witness to give posthypnotic recall, as opposed to a per se prohibition, would be constitutional." J. McCall, "Misconceptions and Reevaluation—Polygraph Admissibility after *Rock* and *Daubert*," 1996 U. Ill. L. Rev. 363, 392–93 (1996).[33]

"The right to present defense evidence was also cited in *McMorris* v. *Israel*, [supra, 643 F.2d 458] in which the defendant offered to stipulate to the admission of a polygraph examination. Although stipulated polygraph results were admissible under state law at that time, the prosecutor, without offering any reasons, refused to stipulate. . . . The court [in granting habeas corpus relief to the defendant] . . . rested its decision on [narrow] grounds; that is, the prosecution's refusal to stipulate without offering a valid ground for the refusal deprived the defendant of due process . . . ." P. Giannelli, "Forensic Science: Polygraph Evidence: Part II," 30 Crim. L. Bull. 366, 375 (1994).

Just recently, in *United States* v. *Scheffer*, supra, 44 M.J. 445–46, the Court of Appeals for the Armed Forces

[33] "The holding in *Rock* v. *Arkansas* [supra, 483 U.S. 44] should be significant in the reconsideration of polygraph evidence because it could dispel the long-standing judicial hostility toward such evidence. This negative attitude is akin to that historically taken toward hypnotically refreshed testimony, and *Rock* teaches that the Sixth Amendment requires courts to give more positive treatment toward a previously hypnotized witness. If the putative Sixth Amendment right of a defendant to present reliable polygraph evidence is acknowledged, courts must consider polygraph evidence with a different attitude." J. McCall, supra, 1996 U. Ill. L. Rev. 406. "[T]he important points from *Rock* on this issue are that the denial position probably violates the Sixth Amendment and that sophisticated judicial and legislative efforts should now be made to limit admission of polygraph evidence so that only the most reliable evidence of this type is admitted." Id., 406 n.309.

held, notwithstanding the military rule of evidence with respect to the inadmissibility of polygraph evidence, that such evidence could not be excluded in a situation where the defendant testified, placed his credibility in issue, and was accused by the prosecution of being a liar. "A per se exclusion of polygraph evidence offered by an accused to rebut an attack on his credibility, without giving him an opportunity to lay a foundation under [the military rule of evidence regarding scientific testimony] and *Daubert*, violates his Sixth Amendment right to present a defense."[34] Id., 445. In *Scheffer*, the court relied on *Rock* for the proposition that per se exclusions of evidence that may be reliable in an individual case cannot stand; *Rock* v. *Arkansas*, supra, 483 U.S. 61; and stated that "[w]hile *Rock* concerned exclusion of a defendant's testimony and this case concerns exclusion of evidence supporting the truthfulness of a defendant's testimony, we perceive no significant constitutional difference between the two. In either case, the Sixth Amendment right to present a defense is implicated." *United States* v. *Scheffer*, supra, 446; see also *United States* v. *Mobley*, supra, 44 M.J. 454–45. Likewise, in the present case, the defendant's right to present a defense is also implicated.[35]

[34] With respect to the defendant's right to lay the foundation for the admission of the polygraph evidence, the *Scheffer* court stated: "[W]e, like the Fifth Circuit, cannot determine 'whether polygraph technique can be said to have made sufficient technological advance in the seventy years since *Frye* to constitute the type of "scientific, technical, or other specialized knowledge" envisioned by Rule 702 [of the Federal Rules of Evidence] and *Daubert*.' *United States* v. *Posado*, [supra, 57 F.3d 433]. We will never know, unless we give [the defendant] an opportunity to lay the foundation." *United States* v. *Scheffer*, supra, 44 M.J. 446.

[35] Although the defendant did not testify in this case, his credibility was at issue as a result of the introduction by the state of his exculpatory out-of-court statement. Furthermore, since the decision to exclude the polygraph evidence was made in a ruling on a pretrial motion, there was no need for the defendant to offer his own testimony as a predicate to raising the question of whether he was entitled to a hearing on the issue of admissibility.

VI

In conclusion, I would remand this case to the trial court in order to furnish the defendant with an opportunity to prove the validity of his polygraph examination and to demonstrate that it was correctly administered in this case. Both the state and the defendant should have the opportunity to be heard on the issue of accuracy and the conditions for the admissibility of the polygraph evidence. Only then do I believe that a court would be in the position to rule on its admissibility. "Where credibility is as critical as in the instant case, the circumstances are such as to make the polygraph evidence materially exculpatory within the meaning of the [federal] [c]onstitution." *McMorris* v. *Israel*, supra, 643 F.2d 462.

Accordingly, I dissent with respect to the issue of the admissibility of polygraph evidence.

STATE OF CONNECTICUT *v.* RUSSELL C. HUNTER
(SC 15364)

Callahan, C. J., and Borden, Berdon, Norcott, Katz, Palmer and McDonald, Js.

Syllabus

Convicted of the crime of robbery in the first degree, the defendant appealed to the Appellate Court, which affirmed the judgment of the trial court, and the defendant, on the granting of certification, appealed to this court. *Held* that, for the reasons expressed by this court in *State* v. *Porter* (241 Conn. 57), the Appellate Court properly affirmed the trial court's exclusion of the results of the defendant's exculpatory polygraph examination without first having conducted an evidentiary hearing.

(One justice concurring and dissenting)

Argued September 24, 1996—officially released May 20, 1997

Procedural History

Substitute information charging the defendant with the crime of robbery in the first degree, brought to the

APPENDIX C

Proposal and Ratification

See note under Amendment [I].

AMENDMENT [VI.]

Jury trial for crimes, and procedural rights

In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the Assistance of Counsel for his defence.

Proposal and Ratification

See note under Amendment [I].

AMENDMENT [VII.]

Civil trials

In Suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved, and no fact tried by a jury, shall be otherwise re-examined in any Court of the United States, than according to the rules of the common law.

Proposal and Ratification

See note under Amendment [I].

AMENDMENT [VIII.]

Excessive bail, fines, punishments

Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

Proposal and Ratification

See note under Amendment [I].

AMENDMENT [IX.]

Construction of enumerated rights

The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people.

§ 2. Enforcement

Section 2. Congress shall have power to enforce this article by appropriate legislation.

Proposal and Ratification

The thirteenth amendment to the Constitution of the United States was proposed to the legislatures of the several States by the Thirty-eighth Congress, on January 31, 1865, and was declared, in a proclamation of the Secretary of State, dated the 18th of December, 1865, to have been ratified by the legislatures of twenty-seven of the thirty-six States.

The amendment was ratified on the following dates:

Alabama	December 2, 1865
Arkansas	April 14, 1865
California	December 15, 1865
Connecticut	May 4, 1865
Delaware	February 12, 1901
Florida	December 28, 1865
Georgia	December 6, 1865
Illinois	February 1, 1865
Indiana	February 16, 1865
Iowa	January 17, 1866
Kansas	February 7, 1865
Louisiana	February 15 or 16, 1865
Maine	February 7, 1865
Maryland	February 3, 1865
Massachusetts	February 7, 1865
Michigan	February 2, 1865
Minnesota	February 23, 1865
Missouri	February 6, 1865
Nevada	February 16, 1865
New Hampshire	June 30, 1865
New Jersey	January 23, 1866
New York	February 3, 1865
North Carolina	December 4, 1865
Ohio	February 10, 1865
Oregon	December 11, 1865
Pennsylvania	February 8, 1865
Rhode Island	February 2, 1865
South Carolina	November 13, 1865
Tennessee	April 7, 1865
Texas	February 18, 1870
Vermont	March 9, 1865
Virginia	February 9, 1865
West Virginia	February 3, 1865
Wisconsin	February 24, 1865

AMENDMENT XIV.

§ 1. Citizenship rights not to be abridged by states

Section 1. All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.

§ 2. Apportionment of Representatives in Congress

Section 2. Representatives shall be apportioned among the several States according to their respective numbers, counting the whole number of persons in each State, excluding Indians not taxed. But when the right to vote at any election for the choice of electors for President and Vice President of the United States, Representatives in Congress, the Executive and Judicial officers of a State, or the members of the Legislature thereof, is denied to any of the male inhabitants of such State, being twenty-one years of age, and citizens of the United States, or in any way abridged, except for participation in rebellion, or other crime, the basis of representation therein shall be reduced in

83 S.Ct. 325, 371 U.S. 943, 9 L.Ed.2d 494, reversed on other grounds 84 S.Ct. 229, 375 U.S. 85, 11 L.Ed.2d 171.

Where defendants attempted later in trial to raise question of constitutionality of search and seizure, reviewing court would consider question, though objection made at time evidence obtained by such search and seizure was offered was not based on illegality of search and seizure. Id.

Determination of the United States Supreme Court that evidence obtained by unlawful search and seizure in violation of federal constitution is inadmissible, and that such rule of exclusion is enforceable against the states under due process clause of Fourteenth Amendment, applied to appeal of a defendant from his conviction, even though such decision was rendered after defendant's conviction. State v. DelVecchio (1962) 182 A.2d 402, 149 Conn. 567.

All evidence obtained by searches and seizures in violation of Federal Constitution is inadmissible in state court. State v. Trumbull (1962) 176 A.2d 887, 1 Conn.Cir. 130, 23 Conn. Sup. 41.

27. Motion to suppress

In accord with a scheme of procedure prescribing that no ruling on evidence pertaining to general issue can be made until after evidence has first been offered in the course of a trial on the merits, neither Connecticut common law, statute nor rules of court recognize a motion in criminal action to suppress evidence allegedly obtained as result of an illegal search and seizure, and denial of attempted motion was proper. State v. Davis (1962) 186 A.2d 383, 1 Conn.Cir. 361, 24 Conn.Supp. 22, certification denied 204 A.2d 934, 150 Conn. 709.

Defendant after a plea of not guilty to a charge of possessing narcotic drugs would not be entitled in advance of assignment for trial, to file a motion to suppress allegedly illegally obtained evidence, since no motion of such type is provided for under the Practice Book, or the general statutes, nor is it recognized by Connecticut common law. State v. Hill (1962) 186 A.2d 381, 24 Conn.Supp. 36.

28. Return of seized articles

Defendant was not entitled to return of articles illegally seized by police even though articles were inadmissible as evidence. State v. Trumbull (1962) 176 A.2d 887, 1 Conn.Cir. 130, 23 Conn.Sup. 41.

Defendant was not entitled, on motion made before impaneling of jury in liquor prosecution, to return of articles seized, or to have them stricken out as evidence after close of state's case, notwithstanding claim that articles were seized in violation of defendant's constitutional rights. State v. Carol (1936) 181 A. 714, 120 Conn. 573.

The courts of this state follow the rule, almost universally respected in the courts of the United States, that public officers will not be compelled to return to its owner any property which is being held in good faith to be used as evidence in any court. State v. Magnano (1922) 117 A. 550, 97 Conn. 543.

29. Review

Where constitutional requirements for a valid search warrant were known at least over eight months prior to trial and a corresponding rule applied to arrest warrants, Supreme Court was not required to consider claims attacking validity of bench warrant and search warrant not raised in trial below, since doctrine that a defendant cannot be required to raise claim which at time of trial appears to lack merit because clearly contrary to settled state law was not applicable. State v. Darwin (1967) 230 A.2d 573, 155 Conn. 124, reversed on other grounds 88 S.Ct. 1488, 390 U.S. 346, 20 L.Ed.2d 430, on remand 243 A.2d 82, 156 Conn. 661, appeal after remand 288 A.2d 422, 161 Conn. 413, appeal after remand 290 A.2d 593, 29 Conn.Sup. 423.

Where attacks on validity of search warrant had not been made prior to appeal, they could not be considered. Id.

§ 8. Rights of accused in criminal prosecutions. What cases bailable. Speedy trial. Due process. Excessive bail or fines. Probable cause shown at hearing, when necessary

Sec. 8. [As amended] In all criminal prosecutions, the accused shall have a right to be heard by himself and by counsel; to be informed of the nature and cause of the accusation; to be confronted by the witnesses against him; to have compulsory process to obtain witnesses in his behalf; to be released on bail upon sufficient security, except in capital offenses, where the proof is evident or the presumption great; and in all prosecutions by information, to a

speedy, public trial by an impartial jury. No person shall be compelled to give evidence against himself, nor be deprived of life, liberty or property without due process of law, nor shall excessive bail be required nor excessive fines imposed. No person shall be held to answer for any crime, punishable by death or life imprisonment, unless upon probable cause shown at a hearing in accordance with procedures prescribed by law, except in the armed forces, or in the militia when in actual service in time of war or public danger.

Historical Note

Amendment Article XVII, in the first sentence, deleted "indictment or" following "and in all prosecutions by"; and in the third sentence, substituted "upon probable cause shown at a hearing in accordance with procedures prescribed by law" for "on a presentment or an indictment of a grand jury".

This amendment was proposed by Laws 1981, H.J.R. No. 36, and was adopted on November 24, 1982.

Prior to Amendment, this section contained provisions similar to those in Consts.1818 and 1955, Art. First, § 9. The provision prohibiting excessive bail or fines was identical with those of Consts.1818 and 1955, Art. First, § 13. The right to bail formerly was a part of both Consts.1818 and 1955, Art. First, § 14.

Cross References

Appeal by accused, stay of execution, see C.G.S.A. § 54-95.
Attorneys, suspension or displacement for just cause, see C.G.S.A. §§ 51-84, 51-94.
Bail,
  Attorney at law, right to give bond or recognizance, see C.G.S.A. § 54-67.
  Cash bail, see C.G.S.A. § 54-66.
  Excessive or insufficient, procedure to increase or diminish, see C.G.S.A. § 54-69.
  Right to bail, see C.G.S.A. § 54-53.
Bonds in criminal cases, procedure to increase or diminish, see C.G.S.A. § 54-69.
Capital cases,
  Indictment by grand jury, see C.G.S.A. § 54-45.
  Testimony required, see C.G.S.A. § 54-83.
Counsel, aid of,
  Mentally ill persons, commitment proceedings, see C.G.S.A. § 17-178.
  Optometrists, suspension or revocation of license, see C.G.S.A. § 20-133.
  Public defenders, see C.G.S.A. § 51-281 et seq.
Direction of guilty verdict prohibited, see C.G.S.A. § 54-89.
Equality of all men, see Art. 1, § 1.
Failure to appear according to bail bond, penalty, see C.G.S.A. § 53-154.
Grand jury, necessity for, see C.G.S.A. § 54-45.
Jurors, qualifications and exemptions, see C.G.S.A. § 51-217 et seq.
Material witnesses, recognizances, see C.G.S.A. § 54-82k.
Mistake in form of recognizance, see C.G.S.A. § 54-71.
Non-capital cases,
  Prosecution by complaint or information, see C.G.S.A. § 54-46.
  Trial by jury of six, see C.G.S.A. § 54-82.
Peremptory challenges, see C.G.S.A. § 54-82g.
Personal liberty, right of, see Art. 1, § 9.
Police officials may take bonds, see C.G.S.A. § 54-64.
Private property, taking, see Art. 1, § 11.
Professional bondsmen, see C.G.S.A. § 29-144 et seq.
Public defenders, see C.G.S.A. § 51-289 et seq.
Right to trial by jury, see Art. 1, § 19; C.G.S.A. § 54-82.
Self-incrimination,
  Alcoholic beverages, tax hearings, see C.G.S.A. § 12-445.
  Bribery at elections, testimony regarding, immunity, see C.G.S.A. § 54-85.
  Claim of privilege, by whom, see C.G.S.A. § 52-199.
  Comment on neglect or refusal of accused to testify, see C.G.S.A. § 54-84.

APPENDIX D

SUBSTITUTE INFORMATION NO. CR4-21800
IN THE SUPERIOR COURT OF THE STATE OF CONNECTICUT JUDICIAL
DISTRICT OF WATERBURY

Maureen M. Keegan, Assistant State's Attorney for the Judicial District of Waterbury accuses and charges RUSSELL HUNTER of Waterbury, Connecticut:

COUNT ONE:

THAT SAID RUSSELL HUNTER did commit the crime of ROBBERY IN THE FIRST DEGREE in violation of General Statutes Section 53a-134(a)(4) in that on or about the 6th day of December, 1992, at approximately 4:15 p.m., at or near Morcey's Restaurant, 572 Watertown Avenue, Waterbury, Connecticut, the said RUSSELL HUNTER, while in the course of committing a larceny, threatened the immediate use of

physical force upon another person; to wit, Peter Morcey III and Kerri Desautels; in that RUSSELL HUNTER threatened the use of what he represented by his words and conduct to be a firearm for the purpose of compelling Peter Morcey III and Kerri Desautels to deliver up the property; to wit, United States currency.

THE STATE OF CONNECTICUT

BY s/s Maureen M. Keegan
Maureen M. Keegan
Assistant State's Attorney
Judicial District of Waterbury

APPENDIX E

NO. CR4-211800 : SUPERIOR COURT

STATE OF CONNECTICUT: JUDICIAL DISTRICT OF WATERBURY

VS.

RUSSELL HUNTER : JULY 19, 1993

MOTION TO SUPPRESS IDENTIFICATION

The defendant, Russell Hunter, by counsel moves, pursuant to C.P.B. §821, the 5th and 14th Amendments to the U.S. Constitution and Article I §8 of the Connecticut Constitution, to suppress any and all evidence of the out-of-court photo array identifications of the defendant by the State's witnesses as such procedures conducted by the Waterbury Police Department were unnecessarily and impermissibly suggestive and unreliable in violation of the defendant's due process rights.

The defendant further moves to suppress or exclude any subsequent

identification of the defendant by the said witnesses and any in-court testimonial identification by said witnesses of the defendant as such would be tainted by the out-of-court identification and violative of the defendant's due process rights.

THE DEFENDANT

BY s/s Theresa M. Dalton
THERESA M. DALTON
Assistant Public
Defender

7-29-93 To time of
trial (Kulawiz, J.)

O R D E R

The foregoing Motion having been heard, it is hereby granted/denied.

THE COURT
(Fasano, J.)

BY s/s _____
JUDGE CLERK

Service Certified:

s/s Theresa M. Dalton
Theresa M. Dalton

APPENDIX F

NO. CR4-211800	:	SUPERIOR COURT
STATE OF CONNECTICUT:		JUDICIAL DISTRICT OF WATERBURY
VS.		
RUSSELL HUNTER	:	OCTOBER 7,1993

MOTION TO ADMIT RESULTS OF POLYGRAPH EXAMINATION AT TRIAL

The defendant, Russell Hunter, hereby moves this Honorable Court pursuant to the Sixth Amendment of the U.S. Constitution, and Article I section eight of the Connecticut Constitution, to permit the defendant to introduce at trial the results of a polygraph examination of the defendant with respect to relevant and material issues in the instant case. In support of the instant motion, counsel represents as follows:

1. The defendant is charged in the

information with the offense of Robbery in the First Degree.

2. The Robbery occurred on 12/6/92 at Morcey's Restaurant in Waterbury at approximately 4:00 p.m.

3. The defendant's photograph was selected by two victims from two photo arrays shown by the Waterbury Police Department.

4. The defendant has consistently denied involvement in this crime.

5. The issue of credibility of the defendant will be critical to the jury.

6. On April 14, 1993, Russell Hunter was administered a polygraph examination by New York Lie Detection Laboratories, 50 Broad Street, New York, NY, a copy of which is attached hereto.

7. The pertinent part of the polygraph report recited:

"The following relevant questions were asked and the indicated answers given.

On December 6th, 1992, did you take any money out of Morcey's Restaurant, 572 Watertown Avenue? NO

On December 6th, 1992, did you rob Morcey's restaurant, 572 Watertown Avenue? NO

On December 6th, 1992, were you inside Morcey's restaurant, 572 Watertown Avenue? NO

No deception was indicated in this examinee's recorded responses to the above relevant questions and it is this polygraphist's opinion that Russell Hunter answered all these questions truthfully.

8. The Connecticut Supreme Court has followed the so called "general acceptance" standard enunciated in Frye

v. United States, 293 F.1013 (D.C. App. 1923) when determining the admissibility of expert testimony. See State v. Miller, 202 Conn. 463 (1987). State v. Plourde, 208 [sic.] Conn. 455 (1988)

For the past 70 years this standard has been upheld as the "prevailing standard for judicial recognition of the probative value of scientific evidence..." State v. Miller, Supra. at 484.

9. On June 28, 1993 the U.S. Supreme Court abandoned the "general acceptance" standard espoused in Frye, in Daubert v. Merrill Dow Pharmaceutical, _____ U.S. _____, 53 Crim. Law Rep. 2313 (June 28, 1993) a copy of which is attached hereto.

In Daubert, the U.S. Supreme Court

decided that the Frye test is not a necessary prerequisite to the admissibility of evidence under Rule 702 of the Federal Rules of Evidence.

The Supreme Court also pointed to Rule 401 and Rule 402 of the Federal Rules of Evidence noting that in defining relevant evidence the rules make no mention of Frye, or its "general acceptance" standard Daubert, Supra at 2316.

Justice Blackman, writing for a unanimous court dealt the final blow to Frye stating "that austere standard absent from and incompatible with the Federal Rules of Evidence, should not be applied in Federal trials". Id. at. 10. The Connecticut Rules of Evidence in this regard are basically the same as Rule 702 and Rule 401 of the Federal Rules of Evidence. See State v. Ward,

172 Conn. 163, 168 (1976), Siladi v. McNamara, 164, Conn. 510, 513 (1973).

The Defendant urges that the Connecticut Courts should likewise follow the trend toward abandoning the Frye test and allowing the trial court to rule on the admissibility of evidence.

11. Prior to the decision in Daubert the trend was moving toward the admissibility of polygraph evidence.

> "In the wake of new empirical evidence and scholarly evidence which have undercut many of the traditional arguments against admission of polygraph evidence, a substantial number of courts have revisited the admissibility question." United States v. Piccinonna, 885 F.2d 1529, 1533 (11th Cir. 1989).

12. The Connecticut Supreme Court recognized that a reconsideration of

the Frye standard was on the horizon in State v. Borrelli, 227 Conn. 153 (1993), noting that Daubert "...casts doubt on the continued viability of the Frye test." Id. at 163 n.10. However since the issue before that court was deemed to be outside the Frye test consideration the Court did not address the issue.

13. Counsel respectfully submits that in light of the Daubert holding polygraph evidence should be admitted in the case at bar upon a proper showing of relevancy.

Counsel contends that a denial of the admission of the polygraph evidence would deny to the defendant his right to compulsory process to obtain witnesses and evidence on his behalf as secured by the Sixth Amendment to the U.S. Constitution and Article I,

Section 8 of the Connecticut Constitution.

Based on the foregoing, the Defendant respectfully requests the Court to schedule an evidentiary hearing to conduct an assessment described by the U.S. Supreme Court in Daubert.

THE DEFENDANT

BY s/s
THERESA M. DALTON
Assistant Public
Defender

APPENDIX G

NO. CR4-211800	:	SUPERIOR COURT
STATE OF CONNECTICUT:		JUDICIAL DISTRICT OF WATERBURY
VS.	:	AT WATERBURY
RUSSELL HUNTER	:	NOVEMBER 29,1993

MEMORANDUM OF LAW IN SUPPORT OF MOTION TO ADMIT RESULTS OF POLYGRAPH EXAMINATION AT TRIAL

For nearly seventy years, an overwhelming majority of federal and state courts have determined the admissibility of scientific expert testimony based upon the 1923 standard set forth in Frye v. United States, 293 F. 1013 (D.C. Cir. 1923). In its decision, the court, without any authority or precedent, rejected the admissibility of evidence derived from a primitive polygraph device:

> [T]he thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular

field in which it belongs.

Frye at 1014.

The Connecticut courts also adopted this "general acceptance" principle which was reaffirmed in State v. Miller, 202 Conn. 463, 522 A.2d 249 (1987).

In 1992, however, the United States Supreme Court granted certiorari in Daubert v. Merrell Dow Pharmaceuticals, Inc., _____ U.S. _____, 53 CrL 2313 (June 28, 1993). In granting certiorari, the Court considered whether the Frye general acceptance test was superseded by the Federal Rules of Evidence. The Supreme Court unanimously agreed that the Frye general acceptance test was superseded by the Federal Rules of Evidence. The Supreme Court unanimously agreed that the Frye test was indeed superseded

when Congress adopted the Federal Rules of Evidence, which specifically includes provisions on expert testimony, in 1975. Similarly, the Connecticut Supreme Court set the foundation for rejecting the Frye test when it adopted similar language in the Connecticut Rules of Evidence as that in Rules 401 and 702 of the Federal Rules of Evidence. See State v. Ward, 172 Conn. 163, 168 (1976); Siladi v. McNamara, 164 Conn. 510, 513 (1973). Even though the Connecticut Supreme Court has ruled that the Federal Rules of Evidence are not binding on Connecticut courts, the Federal Rules of evidence are influential in the shaping, drafting and promulgation of the Connecticut Rules of Evidence.

In Daubert, the plaintiffs alleged that serious birth defects had been

used by the mothers' prenatal ingestion of Benedectin, a prescription anti-nausea drug marketed by the defendant. The defendant moved for summary judgment and in support of its motion filed an affidavit by its medical expert who had reviewed all of the published research on Benedectin. According to this expert, none of the studies had found a causal relationship between the maternal use of Benedectin and the incidence of birth defects. The plaintiffs objected to the defendant's motion and submitted affidavits from eight experts who concluded that Benedectin can cause birth defects based upon in vitro research; animal studies; comparative pharmacological analyses of Benedectin's chemical structure and of other substances known to cause birth

defects; and reanalysis of the published epidemiological studies.

The Ninth Circuit affirmed the district court's decision that the plaintiffs' evidence did not satisfy the general acceptance test because the reanalysis of the epidemiological data had not been published and, therefore, was not subjected to the scrutiny of others in the field.

The Supreme Court, however, disagreed and effectively overturned Frye v. United States. The Court ruled that the Federal Rules of Evidence should control how courts handle scientific evidence. The Federal Rules of Evidence provide trial courts with the power to determine if scientific evidence is relevant and reliable and therefore admissible. In the instant case, the polygraph is directly

relevant to the defendant's credibility because the defendant has consistently denied involvement in the alleged robbery. The defendant's credibility may be bolstered by the fact that he successfully passed a polygraph. Therefore, the issue of defendant's credibility will be critical to the jury. This is the type of evidence which is defined as relevant in Rule 401 of the Federal Rules of Evidence; any evidence that has "[A]ny tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence."

Further, Rule 702 allows opinion testimony by a qualified person:

> If scientific, technical or other specialized knowledge will assist the trier of fact to understand the evidence or

> to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

This is considerably different from the Frye test in which the scientific community must generally accept a scientific principle or test before it can be presented to a jury.

In writing the majority opinion, Justice Harry A. Blackmun emphasized that neither the text of Rule 702 nor the legislative history associated with it indicates an intention by the drafters to incorporate the general acceptance test set forth in Frye. "[A] rigid 'general acceptance' requirement would be at odds with the 'liberal thrust' of the Federal Rules and their 'general approach of relaxing the traditional barriers to "opinion

testimony."'" Daubert, 53 CrL at 2316.

Although the Court found that the Frye test was superseded by the Federal Rules of Evidence, the trial court is still required to screen the scientific evidence to determine whether it is relevant and reliable. Application of the pertinent Federal Rules of Evidence provides guidance in the screening process.

The primary focus of the trial court's obligation is Rule 702 in which an expert may testify "[I]f scientific...knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue." The Court interpreted the term "scientific" as implying a "grounding in the methods and procedures of science" and "knowledge" as connoting

"more than subjective belief or unsupported speculation." Daubert, 53 CrL at 2316. The Court looked to Webster's Third New International Dictionary 1252 (1986) for the common definition of knowledge: "'[a]pplies to any body of known facts or to any body of ideas inferred from such facts or accepted as truths on good grounds.'" The Court, however, cautioned that "it would be unreasonable to conclude that the subject of scientific testimony must be 'known' to a certainty; arguably, there are no certainties in science." Id.

Therefore, in assessing scientific expert testimony, the court preliminarily must determine "[W]hether the reasoning or methodology underlying the testimony is scientifically valid and...whether that reasoning or

methodology properly can be applied to the facts in issue." Daubert, 53 CrL at 2317. In that regard, the Court identified four factors, which is not an (sic) exhaustive or definitive checklist, that a court should consider in it determination under Rule 702:

(1) Whether the expert's theory or technique can be and has been tested?;

(2) Whether the theory or technique has been subjected to peer review and publication?;

(3) What the known or potential rate of error is for any test or technique employed and the existence and maintenance of standards controlling the technique's operation?; and

(4) (while not required) Whether the technique is generally accepted

within the relevant scientific community? Id.

The Court emphasized that this inquiry is of a flexible nature. Further, "the focus, or course, must be solely on principles and methodology, not on the conclusions that they generate." Daubert, 53 CrL at 2318.

Throughout the seventy-year history of the general acceptance test, several concerns regarding the admissibility of polygraph results have been considered by the courts. Many courts that have excluded polygraph evidence have typically relied on three grounds in doing so:

(1) Unreliability of the test;

(2) Lack of standardization of the test procedure; and

(3) Undue impact on the jury.

The defendant submits that these

concerns and grounds are not sufficient to warrant a rigid exclusionary rule, however.

In fact, on the issue of reliability, much of eyewitness testimony, which has a significant margin of error, is routinely admitted. Also other forms of scientific evidence such as blood analysis, DNA analysis and handwriting identifications, which are similarly routinely admitted, involve risks of instrumental or judgmental error. The court in United State v. Piccinonna, 885 F.2d 1529 (11th Cir. 1989) stated:

> Since the Frye decision, tremendous advances have been made in polygraph instrumentation and technique. Better equipment is being used by more adequately trained polygraph administrators. Further, polygraph tests are used extensively by government agencies, e.g. FBI, Secret

Service, Military
intelligence, law enforcement.

Piccinonna, 885 F.2d at 1532.

Secondly, the Piccinonna court addressed and dismissed the concern regarding the lack of standardization when it stated "The American Polygraph Association and state organizations have standards in their charters which members must follow as well." Piccinonna, 885 F.2d at 1533, note 13. In the instant case, the qualifications of Victor Kaufman who conducted the defendant's polygraph illustrate that he had indeed followed similar standards. Specifically, Mr. Kaufman has personally conducted more than ten thousand polygraph examinations since 1958. Mr. Kaufman is also a charter member of the American Polygraph Association and a member of the

Polygraph Examiners of New York State, Empire State Polygraph Society, Virginia Polygraph Association and the Association of Police Polygraphists. In August 1992, Mr. Kaufman was certified by the American Polygraph Association as a practicing Polygraph Examiner.

Finally, there have been concerns that jurors would be unduly impressed with such scientific evidence as the polygraph. In McMorris v. Israel, 643 F.2d 458, 462-463 (7th Cir. 1981), cert. denied. 455 U.S. 967, the court stated that "scientific evidence...has become more a part of the ordinary trial so that jurors may be more likely to use polygraph evidence with discretion."

In Daubert, the defendant expressed the concern that with the

abandonment of the general acceptance test, "junk science" would inundate the judicial process. The Court responded:

> In this regard, respondent seems to us to be overly pessimistic about the capabilities of the jury, and of the adversary system generally. Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.

Daubert, 53 CrL at 2318.

Recently the Connecticut Supreme Court in State v. Borelli, 227 Conn. 153, 163, note 10 (1993), recognized that reconsideration of the Frye standard might be necessary in light of the Daubert decision. The court noted that Daubert "[C]asts doubt on the continued viability of the Frye test." Id.

The court, however, did not address the issue of whether Frye still was controlling law in Connecticut. In fact, in 1989, the court in Piccinonna foresaw the need to readdress the issue of the admissibility of polygraph evidence:

> In the wake of new empirial evidence and scholarly evidence which have undercut many of the traditional arguments against admission of polygraph evidence, a substantial number of courts have revisited the admissibility question.

Piccinonna, 885 F.2d at 1533. The court further stated that "as the field of polygraph testing continues to progress, it may become necessary to reexamine the rules regarding the admissibility of polygraph evidence." Id. at 1537.

Therefore, in light of the fact that the United States Supreme Court

has removed the restrictive Frye standard, the defendant urges the Connecticut courts to reexamine the same and to adopt the more liberal test as set forth in Daubert in which the trial court determines whether the expert's testimony rests on a reliable foundation and whether it is relevant to the issues at hand.

CONCLUSION

For the foregoing reasons, the defendant respectfully requests the Court to schedule an evidentiary hearing to conduct an assessment as described by the United States Supreme Court in Daubert.

THE DEFENDANT

BY /s/ Richard M. Marano
Richard M. Marano,
His Attorney
Marano & Diamond
61 Field Street
P.O. Box 765
Waterbury, CT 06720-0765
Juris No.: 303498
757-6313

CERTIFICATION

I hereby certify that a copy of the foregoing has been hand-delivered this 30th day of November, 1993 to: The Office of the State's Attorney, 30 Bank Street, Waterbury, CT 06702.

/s/ Richard M. Marano
Richard M. Marano
Commissioner of Superior Court

APPENDIX H

NO. CR4-211800	:	SUPERIOR COURT
STATE OF CONNECTICUT:		JUDICIAL DISTRICT OF WATERBURY
VS.	:	AT WATERBURY
RUSSELL HUNTER	:	NOVEMBER 15,1993

STATE'S OBJECTION TO DEFENDANT'S MOTION TO ADMIT RESULTS OF POLYGRAPH EXAMINATION AT TRIAL

The State of Connecticut, by and through its undersigned attorney, objects to the defendant's motion to admit the results of his polygraph examination at trial. The state submits that the following reasons (which will be examined fully) compel this Court to disallow the results of a polygraph examination at trial:

1. The courts of Connecticut have neither departed from the Frye test standard governing admissibility of certain scientific evidence, nor have they ruled that polygraph

examination results should be admissible;

2. Should this Court conclude that, in Connecticut, the Frye test does not govern the admissibility of scientific evidence, the Daubert v. Merrell Dow decision holds that such evidence must still be both relevant and reliable, a standard that polygraph examinations can not meet; and

3. No court in this country, either state or federal, permit admission of polygraph results that are unstipulated and untested by the opposing party, which are the type of results the defendant in the present case seeks to have admitted.

A) Connecticut Caselaw

Connecticut has consistently ruled that polygraph evidence is inadmissible at trial. State v. Miller, 202 Conn. 463, 484 (1987); State v. Saia, 172 Conn. 37, 42 (1976); State v. Mitchell, 169 Conn. 161, 169 (1975); Molino v. Board of Public Safety, 154 Conn. 368, 376-77

(1966). In fact, our state follows the traditional rule of the country that such results are per se inadmissible when offer by either party, either as to substantive evidence or as related to the credibility of the witness. Miller, 202 Conn. at 485 (citations omitted). The defendant seeks to have the results of his polygraph examination admitted to bolster his credibility. Clearly, under the current law of our state, this he cannot do.

In Miller, supra, the Supreme Court declined to depart from the standard announced in Frye v. United States, 293 F. 1013 (D.C. App. 1923) in determining the admissibility of polygraph evidence. In the Miller decision, the Court noted that "questionable accuracy. . . is the most

persuasive reason for excluding polygraph evidence" and that since the overall reliability of such evidence was still widely debated, there was no need to depart from its "per se inadmissible" rule. Miller, supra, 486. In 1988 in the decision of State v. Plourde, 208 Conn. 455, 471, the Supreme Court again noted the questionable accuracy of polygraph tests. Since then, no Connecticut case has addressed the alleged reliability or accuracy of polygraph tests.

Recently, in State v. Borelli, 227 Conn. 153, 163, n. 10 (1993), our Supreme Court noted in dicta that the continued viability of the Frye test had some doubt case upon it by the United States Supreme Court decision of Daubert v. Merrell Dow Pharmaceutical, 53 CrL 2313 (June 28, 1993). The

Borelli court did not, however, reach the issue of whether Frye still controlled in Connecticut. The Daubert decision replaces the Frye standard with the Federal Rules of Evidence in determining the admissibility of scientific evidence in federal court. Our Supreme Court has said, however, that the Federal Rules of Evidence are not binding on our courts. State v. Vilalastra, 207 Conn. 35, 39 (1988). Frye, then, appears to remain the standard by which the admissibility of scientific evidence is tested in this state. The decisions of Plourde and Miller, supra, inter alia, clearly dictate that polygraph test results are not admissible in Connecticut.

B) Admission Under the Federal Rules of Evidence

As previously noted, the United States Supreme Court recently reevaluated the Frye standard governing the admissibility of scientific evidence. Daubert v. Merrell Dow Pharmaceutical, supra.[1] In that decision, the Court held that the Federal Rules of Evidence, not the Frye test, would now govern the admissibility of scientific evidence. Daubert, supra, 2316. The Supreme Court stated, however, that although Frye had been displaced, there were still limits on the admissibility of purportedly scientific evidence. Id. Under the Federal Rules of Evidence,

[1]Daubert did not address polygraph testing; rather the scientific question centered on epidemiological evidence and causation.

such evidence must be both relevant and reliable in order to be admissible. Id.

The question thus becomes whether Daubert now controls the admission of scientific evidence in Connecticut. As stated previously, our Supreme Court has said that although the Federal Rules of Evidence can be influential in shaping our evidentiary rules, they are not binding on our courts. Vilalastra, supra, 39-40. Should this Court decide otherwise, the state points our that Daubert itself holds that scientific evidence must be reliable as well as relevant in order to be admissible. Daubert, supra, 2316. While evidence of polygraph results may arguably be relevant (i.e., corroboration of a witness' testimony) the testing itself

is not yet reliable so as to permit its introduction at trial.

In Daubert, the Court discussed the meaning of "reliability." The Court stated that evidentiary reliability is essentially trustworthiness; Daubert, supra, 2316, n.9; and that in a case involving scientific evidence, evidentiary reliability is based upon scientific evidence, evidentiary reliability is based upon scientific evidence, evidentiary reliability is based upon scientific validity. The Court noted some factors regarding scientific validity. The Court noted some factors regarding scientific validity; Id., 2317; and interestingly, cited "general acceptance" as a factor to be taken into consideration.

Seventy years after the Frye decision, the debate concerning the reliability of polygraph examinations is not over. The majority of courts in this country follow the "per se inadmissible" rule, citing the inherent subjectiveness and unreliability of the polygraph test. See, e.g., State v. Hawkins, 326 Md. 270, 604 A.2d 489, 492 (1992). Other states allow the admission of polygraph tests that have been stipulated to, prior to the subject's examination. See, e.g., State v. Reyes, 237 N. J. Super. 250, 567 A.2d 287 (1989). These same courts, however, have held that had there not been a stipulation, the results would have been inadmissible. See, e.g., State v Cole, 330 A.2d 594, 595 (NJ 1974).

Interestingly, the State of Massachusetts recently reexamined its prior decision to permit admission of polygraph test results. Commonwealth v. Mendes, 547 N.E.2d 35 (1989). In 1974, Massachusetts had ruled that, in certain situations and under strict procedures, polygraph test results could be admissible. Commonwealth v. A Juvenile, 313 N.E.2d 120 (1974). Although the court was not yet convinced of the reliability of polygraph results, the court expressed hope that in the coming years, the development of polygraph testing would reach the stage where it was generally accepted by the scientific community. Fifteen years later in its Mendes decision, the Massachusetts Supreme Court noted that the evidentiary shortcomings of polygraph had not been

alleviated "in the slightest way." Mendes, supra, 41. The court reversed its decision in A Juvenile and held that polygraphic evidence, with or without pretest stipulation, was inadmissible in criminal trials either for substantive purposes or for corroboration or impeachment of testimony. Id.

The defendant has the burden of establishing the reliability of polygraph testing. The State submits that, in light of the reversal by the Massachusetts Supreme Court on the issue of polygraphs (due to the question of reliability) as well as the pronouncements by those courts that allow stipulated polygraph results (in spite of their reservations regarding reliability), the defendant's burden to prove reliability is impossible.

C) Admission of Unstipulated and Untested Polygraph results

The defendant's Motion seeks an evidentiary hearing to determine the relevancy of his polygraph evidence. The defendant has filed a notice of intent to rely on an alibi and a motion in limine seeking exclusion of his prior felony convictions. It is obvious that the defendant's intent in having his polygraph results admitted at trial is to bolster his credibility before the jury.

The defendant's polygraph examination was not stipulated to by the State of Connecticut. Nor has the defendant's examination been tested by an examiner of the State's choice. Nevertheless, the defendant seeks to have the results of his April 14, 1993 test admitted into evidence. A

thorough review of the voluminous caselaw, both state and federal, fails to reveal any case in which a court had admitted into evidence unstipulated, untested polygraph results.

As noted previously the majority of jurisdictions do not allow the admission of polygraph results for any reason. A number of courts allow polygraph results that have been stipulated to, prior to the administration of the test. See, e.g., Anderson v. United States, 788 F.2d 517, 519 (8th Cir. 1986). State v. Bullock, 262 Ark. 394, 557 S.W.2d 193 (1977). State v. Trujillo, 67 Cal. App. 3d 547, 136 Cal. Rptr. 672 (1977); State v. Rowe, 589 N.E.2d 394 (Ohio App. 1990); Wright v. State, 593 N.E.2d 1192 (Ind. 1992). Only one state court allows the admission of unstipulated

polygraph examinations. Tafoya v. Baca, 103 N.M. 56, 702 P.2d 1001 (1985). United States v. Piccinonna, 885 F.2d 1529 (11th Cir. 1989) is illustrative of the approach taken by some federal courts in admitting unstipulated polygraph results. Each opinion, however, details the conditions that polygraph tests must meet in order to be admissible. Moreover, both opinions hold that, if the test is unstipulated, the opposing party must have the opportunity to have an examination done by a party of their choice.

Tafoya v. Baca, supra, is a 1985 decision of the New Mexico Supreme Court that attempted to bring that state's caselaw regarding polygraphs into some consistency. The court noted in the opinion its frustration in

dealing with polygraph test evidence, as well as its reservations as to its continued use. Tafoya, 702 P.2d at 1004-1005. The court then set out the rules governing the admissibility of polygraph results. First, the party seeking to admit the results must give written notice to the opposing side of his intention. Id., at 1005. Once notice is given, the court may compel the witness who had taken the test to submit to another test by an examiner of the other party's choice. Id. If the witness refuses to submit, no polygraph evidence is admissible at trial. Id. While the test in New Mexico may be unstipulated, the opposing side is given the opportunity to have the witness tested by its own expert prior to admission of the results.

United States v. Piccinonna, supra, is similar to Tafoya in the conditions that it sets on the admission of unstipulated polygraph results. The Eleventh Circuit held that such results are admissible if the parties stipulated to the test in advance. 885 F.2d at 1536. The court also held that such results are admissible for impeachment or corroboration purposes subject to three preliminary conditions. Id. First, the party planning to admit the evidence must give adequate notice to the opposing side. Second, the results are admissible only if the opposing party was given reasonable opportunity to have its own expert administer a test covering substantially the same questions. Id. Finally, the admissibility of the examiner's

testimony is to be governed by the Federal Rules of Evidence. Id. The court also noted that, even if the three conditions are met, admission is left entirely to the discretion of the trial judge. Id.

Both cases stress the importance of notice to the opposing side, and opportunity of the opposing side to conduct its own examination. Neither case (indeed, the state found no case) supports the proposition that unstipulated and untested polygraph test results are admissible. Should this court reach and resolve the issue of a hearing on relevance for admission of the results, the state submits that it will need a continuance to administer its own test to the defendant, which the state should be entitled to.

CONCLUSION

The State submits that, for all of the reasons given, this court should deny the defendant's motion. First, there is no authority in Connecticut for the admission of polygraph test results. Second, while the Frye test may be in doubt in federal court, the Federal Rules of Evidence do not control in our state court. Moreover, polygraph evidence can not meet the "reliable and relevant" standard set forth in the Daubert decision. Finally, no court allows the admission of unstipulated and untested polygraph test results.

The Maryland Supreme Court recently denied, once again, the admission of polygraph test results. State v. Hawkins, 604 A.2d 489 (Md.

1992). The court there noted that "the reliability of such tests has not been established to our satisfaction, and we have consistently refused to permit evidence with regard to them. (Citations omitted). In our system of criminal justice, the trier of fact is the lie detector, and we have been steadfast in disallowing that function to be usurped by a process we have not found to be trustworthy." Id., at 492.

The Connecticut courts have ample reason to disallow the results of polygraph tests. As Maryland has noted, the jury is the lie detector. The State urges this court to deny the defendant's motion.

THE STATE OF CONNECTICUT

BY /s/ Maureen M. Keegan
Maureen M. Keegan
Assistant State's Attorney
Judicial District of Waterbury

Service certified:

Richard Marano, Esquire
61 Field Street
Waterbury, CT 06702

By/S_____
Maureen M. Keegan

APPENDIX I

NEW YORK LIE DETECTION LABORATORIES
A Division of Victor C. Kaufman, Inc.
50 Broad Street -- Suite 1020
New York, NY 1004-2345

--

212-344-2626

SUBMITTED TO: Public Defender,Waterbury
300 Grand Street
Waterbury, CT 06702

CONFIDENTIAL
ATTENTION: _____

RE: _____
(Name of Subject) (Date)

ARRANGEMENTS: The above named subject was given a Polygraph Examination for the purpose of determining the truthfulness of the answers to the following questions.

PROCEDURE: A four pen Lafayette Polygraph was utilized to register changes in blood-pressure, rate and strength of pulse-beat, galvanic skin response, and the respiratory pattern.

The following relevant questions were asked and the indicated answers given.

On December 6th, 1992, did you take any money out of Morcey's Restaurant, 572 Watertown Avenue? NO

On December 6th, 1992, did you rob Morcey's restaurant, 572 Watertown Avenue? NO

On December 6th, 1992, were you inside Morcey's restaurant, 572 Watertown Avenue? NO

POLYGRAPHIST'S OPINION No deception was indicated in this examinee's recorded responses to the above relevant questions and it is this polygraphist's opinion that Russell Hunter answered all these questions truthfully.

Victor C. Kaufman

Polygraphist

APPENDIX J

STATE OF CONNECTICUT

UWY CR92 211800T
SUPERIOR COURT

STATE OF CONNECTICUT JUDICIAL DISTRICT

V. OF WATERBURY

RUSSELL C. HUNTER,
of Waterbury, FEBRUARY 1, 1994
Connecticut

Present: Hon. Roland D. Fasano, Judge

JUDGMENT

Upon an information dated December 11, 1992, charging the defendant Russell C. Hunter with the crime of Robbery in the First Degree, in violation of Section 53a-134 of the General Statutes, the defendant appeared at the Superior Court, G.A. 4, on December 15, 1992, and said action came thence to December 22, 1992, when the case was ordered transferred to the Superior Court, Waterbury J.D., and thence to January 4, 1993, when the defendant pleaded not guilty and elected a jury trial, and thence to September 30, 1993, when the defendant's motion for speedy trial was granted.

Said action came thence to November 3, 1993, when the State filed a bill of particulars and an amended substitute information charging the defendant with the crime of Robbery in the First Degree, in violation of Section 53a-134(a)(4) of the General

Statutes, and when the defendant pleaded not guilty and elected a jury trial, and thence to November 16, 1993, when jury selection began, and thence to November 24, 1993, when the court denied that part of the defendant's motion to suppress identification that had not been withdrawn, and thence to December 1, 1993, when the court denied the defendant's motion to admit results of polygraph examination at trial.

Said action came thence to December 7, 1993, when a jury having been selected and sworn, trial commenced, and thence to December 8, 1993, when after the State rested its case in chief, the court denied the defendant's oral motion for judgment of acquittal, and thence to December 10, 1993, when all the evidence having been presented, said action was committed to the jury, and thence December 14, 1993, when after due deliberation, the jury returned a verdict of guilty. The verdict was ordered accepted and recorded, and the court denied the defendant's motion to poll the jury. Said action was then continued for sentencing, a presentence investigation and report having been ordered.

Said action came thence to the present time when the defendant appeared for sentencing.

Whereupon It Is Adjudged that on the charge of Robbery in the First Degree, in violation of Section 53a-134(a)(4) of the General Statutes, the defendant Russell C. Hunter be committed to the custody of the Commissioner of Correction for a term of 16 years, execution suspended after

9 years, with 3 years probation. As special conditions of probation, the defendant is to undergo substance abuse counseling, testing, or treatment as deemed necessary; the defendant is not to possess any controlled substance; the defendant is to participate in job counseling. Costs and fees are waived.

By the Court (Fasano, J.)

/s/ Catherin J. Capuano
Catherine J. Capuano
Assistant Clerk

APPENDIX K

STATE OF CONNECTICUT *v.* RUSSELL C. HUNTER
(13358)

O'CONNELL, LAVERY and LANDAU, Js.

Argued February 14—decision released March 21, 1995

Substitute information charging the defendant with the crime of robbery in the first degree, brought to the Superior Court in the judicial district of Waterbury and tried to the jury before *Fasano, J.*; verdict and judgment of guilty, from which the defendant appealed to this court. *Affirmed.*

Richard M. Marano, for the appellant (defendant).

Lisa Herskowitz, deputy assistant state's attorney, with whom, on the brief, were *John Connelly,* state's attorney, and *Maureen Keegan,* assistant state's attorney, for the appellee (state).

PER CURIAM. This case is controlled by *State* v. *Miller*, 202 Conn. 463, 522 A.2d 249 (1987), and *State* v. *Barnes*, 27 Conn. App. 713, 610 A.2d 689, cert. denied, 223 Conn. 914, 614 A.2d 826 (1992).

The judgment is affirmed.

APPENDIX L

SUPREME COURT
STATE OF CONNECTICUT

NO. PSC-94-0322

State of Connecticut

v.

Russell Hunter

ORDER ON PETITION FOR CERTIFICATION TO APPEAL

On consideration of the petition by the defendant for certification to appeal from the Appellate Court (37 Conn. App. 907 [AC 13358]), it is hereby ordered that said petition be, and the same is hereby granted, limited to the following questions:

Under the circumstances of this case: (1) Did the Appellate Court properly conclude that the trial court was correct in denying the defendant's request for an evidentiary hearing regarding the admissibility of the defendant's polygraph evidence? (2) Should this court reconsider the applicability of the test for determining the admissibility of scientific evidence set forth in *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923), in light of the United States Supreme Court's decision in *Daubert v. Merrill Dow Pharmaceuticals, Inc.*, U.S., 113 S. Ct. 2786, L. Ed. 2d (1993)?

BY THE COURT

ASSISTANT CLERK-APPELLATE

Dated: February 13, 1996

APPENDIX M

CR4-211800 S

**********x

STATE OF CONNECTICUT	:	SUPERIOR COURT OF CONNECTICUT
-VS-	:	JUDICIAL DISTRICT OF WATERBURY
RUSSELL HUNTER	:	AT WATERBURY
**********x		DEC. 1, 1993

B E F O R E:

THE HONORABLE ROLAND D. FASANO, JUDGE

A P P E A R A N C E S:

MAUREEN KEEGAN, ESQUIRE
Assistant State's Attorney
30 Bank Street
Waterbury, Connecticut
ATTORNEY FOR THE STATE OF CONNECTICUT

RICHARD M. MARANO, ESQUIRE
Special Public Defender
61 Field Street
Waterbury, Connecticut
ATTORNEY FOR THE DEFENDANT

Nancy Zanfardino
Certified Shorthand Reporter

MR. MARANO: Good morning, Your Honor.

THE COURT: Mr. Hunter is here. All right. We're ready to proceed on the defendant's motion with respect to the polygraph.

MR. MARANO: Yes, Your Honor. The defense filed a memorandum of law on November 29. To my understanding it is in the court's file. I would like to have an opportunity, Your Honor, to be heard on the motion. Your Honor, the defense is relying on U.S. Supreme Court, Daubert versus Merrell Dow Pharmaceuticals, in this case in support of its motion to admit the results of a polygraph examination at trial. As the Court is well aware, the scientific evidence for the last seventy years since 1923 was based on the Frye standard. The Frye standard

was set by the U.S. Supreme Court back in 1923 without precedent, without any authority to support it, yet it's been the law of the land for the last seventy years, while it has been adopted in Connecticut, I'm asking the Court to adopt the Daubert test in this case and allow the introduction of the polygraph. In the Daubert case the U.S. Supreme Court unanimously decided that Frye super-- was superseded by the Federal Rules of Evidence adopted by Congress in 1975. Federal Rules of Evidence, while they are not controlling in the state courts, they are influential in Connecticut Courts and indeed our rules of evidence are modeled very closely on the Federal Rules of Evidence. The language in the state rules is very similar to the language of the Federal Rules 401 and

702. When the ninth circuit heard Daubert, the ninth circuit decided that the general acceptance test was-- wasn't-- standard wasn't met by the evidence that was presented. But U.S. Supreme Court disagreed and an unanimous decision rejected Frye and very clearly said that the-- in deciding whether or not to introduce scientific evidence the courts have to look to the federal rules. The test being the reliable and relevant. If it meets that two prong test, reliable and relevant, then the scientific evidence would be admissible.

In this case we have a polygraph which the defendant contends that he passed. The allegation-- underlying charge is a robbery in the first degree in which the defendant denies. And the critical issue, of course, is

credibility. If the defendant chooses to testify in this case, of course, maintains that he didn't rob the Morcey's Restaurant, what, if any, scientific tests exist in 1993 will bolster his ascertain of innocence on the issue of credibility. Credibility, of course, being the critical issue for the jury in this case.

So the defense is arguing that the relevancy under Federal Rule 401 would be met with the introduction of polygraph. Under Rule 702, the reliability, that's open for the Court's determination of whether or not the polygraph in this case is reliable. Was a qualified individual-- Did a qualified individual conduct the test, based on his-- and using the same test for expertise, based on knowledge, skill, experience, training or

education. So if the two prong test of reliability and relevancy are met the Court should consider or should by virtue of those findings admit the polygraph. The standard, of course, is very different from the general acceptance test in Frye. Justice Blackburn-- Blackmun, excuse me, stated that this test, reliability and relevance, is at odds with the general acceptance test for the reason that the liberal thrust of the federal rules is at odds with the general acceptance test. So the trial court has to screen to see if the scientific test is reliable and relevant. Under Federal Rules 702 scientific evidence is determined to be reliable if the knowledge will assist the trier of fact in determining a fact issue.

Now, it's conceded that the polygraph is not one hundred percent accurate. Our expert would testify that the standard in his profession indicates that it's about ninety percent accurate. But Daubert-- the Court in Daubert stated that a scientific test need not be known to an absolute certainty. If-- it went on to say, if the reasoning or methodology underlying the testimony is scientifically valid and it can be applied to the facts at issue, the Court is guided by four factors, which to judge the-- to determine under-- the reliability under Rule 702.

Going back to the general acceptance test. There were four reasons or three reasons to exclude a polygraph, specifically. One was unreliability. Now, we're talking

about a polygraph administered seventy years after the 1923 decision and when we discuss reliability of the polygraph we have to determine the great inroads and advances regarding the technique of the polygraph. Now, is it one hundred percent reliable? No. But neither is eye witness testimony which has a significant margin of error. Neither is DNA analysis. Neither is handwriting identifications. All of them involve risk of human errors. All of them involve risk of mechanical misfunction. The second exclusion of the polygraph in 1923 was the lack of standardization. In the Piccinonna case the eleventh circuit dealt with this issue of lack of standardization in the polygraph and determined that no in 19--

THE COURT: Eighty-nine, I think.

MR. MARANO: Seventies.

THE COURT: Piccinonna is '89.

MR. MARANO: Lack of standardization is met in that there are numerous associations which have rules of membership for polygraph administrators. Charters which have established the rules they must follow. In this case Victor Kaufman is the proposed expert and the defense submits to the Court that he's conducted over ten thousand polygraphs in thirty-five years. He's a charter member of the American Polygraph Association, a member of the Polygraph Examiners of New York State, Empire State Polygraph Society, Virginia Polygraph Association and the Association of Police Polygraphists. In 1992 he was

certified by the American Polygraph Association as a practicing polygraph examiner.

The third exclusion or reason for exclusion was the undue impact on the jury. But in 1993 and in the 1990's as opposed to 1920's the scientific evidence the Court noted in Daubert is becoming part of the ordinary trial procedure and the Court's suggestion that juries are going to have to deal with the polygraph or deal with scientific testing, rather, with appropriate discretion. In other words, while it might be somewhat shocking to some people that polygraph at some point be admissible at trial, it's something that a jury would get used to using as any other scientific test or new scientific test that develops. One of the problems is that

polygraphs most-- were specifically excluded for a number of years for a number of different reasons. There's this attitude that a polygraph is always to be excluded.

Now, the defense in Daubert, Your Honor, was also concerned with a number of other issues. This junk science issue. The Court addressed in four thoughtful ways how admission of certain scientific evidence gets by this junk science criticism. One is the adversary system. We still have adversary system. We still have the state's burden, the state's experts, state's witnesses in order to prove a defendant guilty beyond a reasonable doubt. The polygraph is not being proposed in order to try to-- to try the case. The polygraph is being offered for whatever weight the trier

of fact is going to use it for in order to determine what if anything it has to do with the defendant's credibility. Or the individual's credibility when he testifies. The Daubert Court also discussed the vigorous cross-examination is possible. Under scientific testing that is possible, in fact, to discredit a scientific expert who asserts a certain theory. There's contradictory evidence and there's instruction by the Court on the burden of proof, to protect the polygraph in this case, in this argument, from becoming the trier of fact on the issue of guilt or innocence. In State versus Borelli the footnote on page one-sixty-three, the Court-- Connecticut Supreme Court indicates that Frye might be reconsidered in light of Daubert. While it's not addressed in Borelli,

we're asking in this case, Your Honor, that this Court apply the Daubert test. It's clear that the general acceptance test is no longer good law that is the standing law of the Connecticut Supreme Court, so we're asking the Court to apply the Daubert test and use the relevance and reliability standard, Your Honor, which in this case I believe would pass muster as another tool for an accused to fight the charges of the state. Thank you, Your Honor.

THE COURT: Okay. Ms. Keegan.

MS. KEEGAN: Your Honor, the state has filed a motion in support of its objection to any admission of polygraph result at trial. The state notes first that the defendant is not without any means of putting forth his credibility in terms of his innocence

in the case before a jury. He has his ability to testify, if he so chooses, as well as his alibi witnesses. So he's not without any remedies whatsoever when he goes before a jury. More importantly, Your Honor, as a basic principle, that Connecticut courts look to Connecticut Law in determining issues within their boundaries. Connecticut Law says polygraphs are nonadmissible. It's not just a basic reliance on Frye. If Your Honor goes to State versus Miller, 1987 decision, not that long ago, the Supreme Court says that the questionable accuracy of polygraph examinations is the most persuasive reason for excluding polygraph evidence. The Court was quoting from Brown versus Darcey, an earlier decision of the Supreme Court excluding

polygraph evidence. And after quoting that says, quote, we see no reason to depart from that rule. If the Court looks to decisions of the other states, the reliability of polygraph evidence is still debated. Even in Piccinonna, the eleventh circuit, polygraph is a developing and inexact science, later on say, we proceed with caution in this area because the reliability of polygraph testing remains a subject of intense scholarly debate.

Mr. Marano has pointed to no law of this state which supports his proposition that he is entitled to a hearing on the reliability of polygraph evidence. Connecticut does not allow it. The Federal Rules of Evidence are not binding on our court. The decision of the United States Supreme Court regarding Federal Rules of Evidence are

not binding on Connecticut which follows its own case law.

THE COURT: Are you saying Connecticut doesn't allow a hearing? I'm just-- are you saying that it's per se exclusion that doesn't even allow a hearing.

MS. KEEGAN: It doesn't even allow a hearing?

THE COURT: A hearing on the issue of the-- of either admissibility or credibility or reliability?

MS. KEEGAN: Yes, Your Honor, because Connecticut does follow the per se inadmissible rule on polygraph testing.

THE COURT: There's a 1992 case, State versus Barnes in which the polygraph was rejected again, but they did given him a full hearing. In any event, I mean, what case are you

referring to that says there's a per se exclusion?

MS. KEEGAN: No, I point to no case there's a per se exclusion on any hearings. I merely point to the case law of Connecticut that says there's a per se exclusion on polygraph evidence. But, if you want to go on to the reliability, the defendant is going to have a very tough burden to prove reliability on polygraph evidence. I've gone through numerous cases in my brief. I think the most illustrative case is a case from Massachusetts in 1989, Commonwealth versus Mendes. In 1974 the State of Massachusetts had allowed polygraph evidence. It said that it was a developing science; they hoped that in the coming years polygraph testing would be more and more advanced. In 1989 the

Massachusetts Supreme Court took it all back and said, we're not going to allow polygraph for anything because it is not reliable, it has not met the standards of reliability. In Connecticut, Connecticut was prudent in not allowing it in the seventies like many other states did, because now Massachusetts had to go back and keep polygraph evidence out. Connecticut was prudent never to allow it.

The bottom line here, Your Honor, is the quote I quoted at the end of the brief from the Maryland Supreme Court, the jury is the lie detector, if you will, the jury listens to the evidence. There's no room in courts in Connecticut for any admission of polygraph evidence. That State would submit that based on its brief the Court should exclude any polygraph

evidence from being admitted in this trial.

MR. MARANO: Briefly, Your Honor, U.S. Supreme Court has rejected Frye. I think it's a fair assessment the Connecticut Law to assert that Connecticut is setting a foundation to specifically reject Frye. And, while I agree that it's not the law of this state, I disagree that the law does not allow it. I agree the law hasn't allowed it. In light of Daubert I think that the Court should allow it in this case. That's all I would like to add, Your Honor. That's all I'll point out.

THE COURT: I have had a chance to review all the materials submitted by both sides and there's certainly a huge volume of law rejecting polygraph evidence all over the country.

Connecticut has uniformally rejected any offer in any form either for impeachment or other purposes, uniformally rejected polygraph results, and in some instances, though, this is much rarer, for instance, in the Miller case referred to as per se inadmissible. That the main reason for the rejection it appears, particularly, in Connecticut, is the issue of reliability. Now, more up to date cases, in 1992 it was rejected again in State versus Duntz, D-u-n-t-z, by our Connecticut Supreme Court, and in 1992 it was rejected after a full hearing by the Appellate Court in State versus Barnes. State versus Barnes is interesting because the hearing involved an expert by the name of Victor Kaufman. I assume that's the same individual. There's not a lot of

Victor Kaufman's hanging around, I suppose.

MR. MARANO: Yes, Your Honor.

THE COURT: Well, the Court in that instance found there were no changes. The reliability problem still existed. There was nothing special or distinguishing circumstances since then and it seems to me we would be basically rehashing the same material after a 1992 decision. Even absent Frye, even if the Daubert case becomes the precedent in Connecticut, we still have the issue of reliability as well as relevance. And, the other issue of whether or not it would be any kind of aid to the jury. In that regard the main concern is that it would usurp the function of the jury. It is the jury's function to determine credibility and this sort of evidence would tend to

usurp that function. It would tend to, in one of the cases it was pointed out, cloud the issue of credibility with the aura of scientific conclusiveness. That's a real danger. If the jury is deciding an issue of credibility, it hears there's a scientific opinion, which finds in one fashion or another, they would naturally be swayed in that regard. That would be appropriate. I don't want to reduce the issue of credibility to a battle of the polygraph experts. I don't think that's appropriate. I don't think Connecticut intends to have that sort of situation with respect to the jury's function in determining credibility.

Under all the circumstances at this point I will not allow evidence with regard to polygraph results; despite-- no matter which standard is

used, whether it's Daubert or Frye, we have some of the same factors coming into play.

MR. MARANO: May I have an exception, Your Honor?

THE COURT: Exception is noted.

MR. MARANO: Thank you, Your Honor.

THE COURT: Anything further on this issue?

MS. KEEGAN: Not on this issue. I don't believe we have any other outstanding motions before trial is to begin on Tuesday.

THE COURT: We're ready to begin on Tuesday.

MR. MARANO: Tuesday. Ten o'clock.

THE COURT: Fine.

(Whereupon, this matter was concluded.)

CR4-211800 S

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STATE OF CONNECTICUT	:	SUPERIOR COURT OF CONNECTICUT
-VS-	:	JUDICIAL DISTRICT OF WATERBURY
RUSSELL HUNTER	:	AT WATERBURY
**********x		DEC. 1, 1993

C E R T I F I C A T I O N

This is to certify that I, Nancy Zanfardino, a Certified Shorthand Reporter and Notary Public in and for the State of Connecticut, certify that the foregoing is a true and accurate transcript of my stenographic notes taken with reference to the above-entitled matter, heard before the

(2)

Supreme Court, U.S.
FILED
JAN 8 1998
CLERK

No. 97-723

In The

Supreme Court Of The United States

October Term, 1997

RUSSELL HUNTER,

Petitioner

v.

STATE OF CONNECTICUT,

Respondent

ON PETITION FOR WRIT OF CERTIORARI
TO THE SUPREME COURT OF THE
STATE OF CONNECTICUT

RESPONDENT'S BRIEF IN OPPOSITION

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QUESTION PRESENTED

Whether the Connecticut Supreme Court correctly determined that its decision to exclude polygraph evidence from state trials does not violate the federal due process right to present a defense?

TABLE OF CONTENTS

PAGE

QUESTION PRESENTED i

TABLE OF AUTHORITIES iii

OPINIONS BELOW 1

STATEMENT OF THE CASE 2

Background 2

The Connecticut Supreme Court's Opinion 4

ARGUMENT 7

This Court's Jurisprudence On The Right To Present A Defense 9

The Connecticut Supreme Court's Decision Does Not Conflict With This Court's Jurisprudence On The Right To Present A Defense 13

CONCLUSION 18

TABLE OF AUTHORITIES

PAGE

CASES

Chambers v. Mississippi, 410 U.S. 284, 93 S. Ct. 1038, 35 L. Ed. 2d 297 (1973) 8, 10-14, 16-18

Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993) 2-5

Frye v. United States, 293 F. 1013 (D.C. App. 1923) 2- 4

Montana v. Egelhoff, ___ U.S. ___, 116 S. Ct. 2013, 135 L. Ed. 2d 361 (1996) 8

Rock v. Arkansas, 483 U.S. 44, 107 S. Ct. 2704, 97 L. Ed. 2d 37 (1987) 4, 8, 12-15, 17,18

State v. Barnes, 27 Conn. App. 713, 610 A.2d 689, *cert. denied*, 223 Conn. 914, 614 A.2d 826 (1992) 2, 3

State v. Hunter, 236 Conn. 907, 670 A.2d 1307 (1996) 4

State v. Hunter, 241 Conn. 165, 694 A.2d 131-7 (1997) .. 1, 4

State v. Hunter, 37 Conn. App. 907, 655 A.2d 291 (1995) 1, 3

State v. Miller, 202 Conn. 463, 522 A.2d 249 (1987) 2

State v. Mitchell, 169 Conn. 161, 362 A.2d 808 (1975) 2

State v. Porter, 236 Conn. 908, 670 A.2d 1308 (1996) 4

State v. Porter, 241 Conn. 57,
698 A.2d 739 (1997) 1, 4-7, 15-16

Washington v. Texas, 388 U.S. 14, 87 S. Ct. 1920,
18 L. Ed. 2d 1019 (1967) 4, 8-10, 13-15

STATUTES

Connecticut General Statutes § 53a-134 2

CONSTITUTIONAL PROVISIONS

Amendment VI to the United States Constitution 3

OPINIONS BELOW

The Connecticut Appellate Court affirmed the petitioner's conviction in *State v. Hunter*, 37 Conn. App. 907, 655 A.2d 291 (1995). The Connecticut Supreme Court affirmed the Appellate Court's judgment in *State v. Hunter*, 241 Conn. 165, 694 A.2d 1317 (1997). The Connecticut Supreme Court's analysis of the constitutional question is contained in its opinion in the companion case of *State v. Porter*, 241 Conn. 57, 698 A.2d 739 (1997).

STATEMENT OF THE CASE

Background

The petitioner was arrested on December 14, 1992, in connection with a robbery at Morcey's Restaurant in Waterbury, Connecticut. The State subsequently charged the petitioner by substitute information with the crime of robbery in the first degree in violation of Connecticut General Statutes § 53a-134(a)(4). The petitioner pleaded not guilty and elected a jury trial.

On October 8, 1993, the petitioner filed a written motion in limine seeking authorization to introduce at trial the results of a polygraph examination he had taken. At that time, Connecticut employed the "general acceptance" standard of *Frye v. United States*, 293 F. 1013 (D.C. App. 1923), in determining the admissibility of novel scientific evidence. The Connecticut courts had held that polygraph evidence is inadmissible at trial because of its lack of general acceptance, unreliability, and potential to mislead jurors. *See, e.g., State v. Miller*, 202 Conn. 463, 484-86, 522 A.2d 249 (1987); *State v. Mitchell*, 169 Conn. 161, 169-70, 362 A.2d 808 (1975); *State v. Barnes*, 27 Conn. App. 713, 716, 610 A.2d 689, *cert. denied*, 223 Conn. 914, 614 A.2d 826 (1992).

The petitioner's motion argued that Connecticut should abandon the *Frye* test in light of this Court's abandonment of that test in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993). It requested the trial court to conduct an evidentiary hearing

concerning the admissibility of the petitioner's polygraph results utilizing the factors described in *Daubert*.

The trial court held a hearing on the petitioner's motion and noted that in a recent Connecticut Appellate Court opinion, the court had concluded that polygraph evidence was still too unreliable to be admissible. *See State v. Barnes*, 27 Conn. App. at 716. The trial court in the *Barnes* case had held an evidentiary hearing on the defendant's proffer of his polygraph results. The trial court in the instant case asked the petitioner whether there had been any improvements in polygraph reliability since the hearing in the *Barnes* case. Petitioner's counsel said he did not know. The trial court denied the petitioner's motion, holding that the unreliability of polygraph evidence and its potential to mislead jurors would make it inadmissible in Connecticut even if the standards in *Daubert* were adopted.

The petitioner appealed to the Connecticut Appellate Court, claiming that the trial court should have abandoned the *Frye* test in favor of the standards enunciated by this Court in *Daubert* and held an evidentiary hearing on the admissibility of his polygraph results.[1] The Connecticut Appellate Court affirmed the trial court's judgment in a one-sentence opinion. *State v. Hunter*, 37 Conn. App. at 907. The Connecticut Supreme Court granted certification to review the Appellate Court's decision, limited to two issues: "(1) Did the Appellate Court properly conclude that

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[1]In his motion in limine and Appellate Court brief, the petitioner cited the sixth amendment in support of his position but did not present a constitutional analysis of the right to present a defense.

the trial court was correct in denying the defendant's request for an evidentiary hearing regarding the admissibility of the defendant's polygraph evidence?" and "(2) Should this court reconsider the applicability of the test for determining the admissibility of scientific evidence set forth in *Frye* . . . in light of the United States Supreme Court's decision in *Daubert* . . .?" *State v. Hunter*, 236 Conn. 907, 670 A.2d 1307 (1996). The court certified the same two issues in *State v. Porter*, 236 Conn. 908, 670 A.2d 1308 (1996).

In his brief to the Connecticut Supreme Court, the petitioner argued that the trial court's refusal to accord him an evidentiary hearing on the admissibility of his polygraph evidence violated his due process right to present witnesses and evidence on his own behalf. His brief cited this Court's decisions in *Washington v. Texas*, 388 U.S. 14, 87 S. Ct. 1920, 18 L. Ed. 2d 1019 (1967) and *Rock v. Arkansas*, 483 U.S. 44, 107 S. Ct. 2704, 97 L. Ed. 2d 37 (1987). On September 24, 1996, the Connecticut Supreme Court heard oral argument concerning the instant case and the *Porter* case. On May 20, 1997, the Connecticut Supreme Court released its decisions affirming the judgments in both the *Hunter* and the *Porter* cases.

The Connecticut Supreme Court's Opinion

The Connecticut Supreme Court's decision in the instant case is brief and references the court's lengthy opinion in the *Porter* case. *See State v. Hunter*, 241 Conn. at 167. In the *Porter* opinion, the court decided to abandon the *Frye* standard

in favor of the principles adopted by this Court in *Daubert*. *State v. Porter*, 241 Conn. at 66-92. The Connecticut Supreme Court also concluded that polygraph evidence should remain inadmissible in judicial proceedings subject to the rules of evidence, because the probative value of such evidence is outweighed by its prejudicial impact. *Id.* at 94, 115. The court conducted an extensive review of the scientific literature and the methodology of polygraphy. *Id.* at 94-124. The court noted that there existed wide disagreement in the literature regarding the accuracy of polygraph exams, largely due to disagreement among the experts concerning which methods of measuring accuracy and which studies within each method are methodologically valid. *Id.* at 105-106. The court also noted that without reliable information on the percentage of people who take polygraphs who lie and the percentage who tell the truth, it is impossible to assess the predictive value of a particular polygraph result. *Id.* at 109-113. Finally, deceptive examinees schooled in countermeasures can avoid detection more than fifty percent of the time. *Id.* at 114.

Against the questionable probative value of polygraph evidence, the Connecticut Supreme Court weighed its potential for prejudice. The court noted that jurors are competent to evaluate credibility without expert testimony. *Id.* at 116. It distinguished polygraph evidence from other types of scientific evidence, noting that while jurors cannot themselves determine, for example, whether a bloodstain contains DNA consistent with a particular individual, the jury has always been entrusted with

determining credibility. *Id.* at 116-117. The Court concluded that "polygraph evidence so directly abrogates the jury's function that its admission is offensive to our tradition of trial by jury" and that "it violates the premise of this entire system to allow a single person -- the polygrapher -- to label a witness as honest or dishonest based solely on the same type of indirect evidence that we generally maintain takes an entire jury to evaluate." *Id.* at 118-119. The court also noted that the admission of polygraph test results at trial would likely produce regular and immensely time-consuming battles of the experts. *Id.* at 121. In every case, the trial court would have to consider the training and competence of the examiner, whether the examination questions were appropriate, and whether the test was correctly administered. *Id.* at 121-23. In addition, "[b]ecause many experts doubt the entire physiological and emotional basis of the polygraph test, many courtroom skirmishes will be fought over the scientific validity of the entire polygraph procedure." *Id.* at 122-23.

The Connecticut Supreme Court concluded based on these considerations that the prejudicial impact of polygraph evidence outweighs its probative value. *Id.* at 124. The court noted that its decision was supported by the majority of states that had considered the issue. *Id.* at 124-25. The court also considered the experiences of four states -- Massachusetts, Wisconsin, North Carolina and Oklahoma -- that admitted polygraph evidence for a period of time, then retreated to a per se rule of inadmissibility. *Id.* at 127-29.

Finally, the Connecticut Supreme Court concluded that the trial court's refusal to accord the defendant an evidentiary hearing on the admissibility of his polygraph results did not deprive him of his constitutional right to present a defense. The court noted that the right to present relevant testimony is not without limitation and that evidentiary rules violate the federal constitution only when (1) without a rational basis, they disadvantage the defendant more severely than the prosecution, or (2) they arbitrarily exclude reliable defense evidence without achieving a superior social benefit. *Id.* at 133-34. The court concluded that the exclusion of polygraph evidence does not violate the constitution because "there is a very strong basis for excluding polygraph evidence" and "such exclusion is not arbitrary given the polygraph test's demonstrated lack of probative value." *Id.* at 134. The court stated that:

> If, at some future date, *substantial* evidence indicates that some polygraph or other lie detection technique has reached a sufficiently high level of validity that the probative value of such evidence potentially outweighs its prejudicial impact, we may be forced to revisit this issue.

Id. at 136.

ARGUMENT

State courts must be allowed latitude in fashioning evidentiary rules to govern their own judicial proceedings. Although criminal defendants have a federal constitutional right

to present a defense, this Court has concluded that "the proposition that the Due Process Clause guarantees the right to introduce all relevant evidence is simply indefensible." *Montana v. Egelhoff*, ___ U.S. ___, 116 S. Ct. 2013, 2017, 135 L. Ed. 2d 361 (1996). In light of these principles, it would be inappropriate for this Court to grant certiorari unless the petitioner can establish that the circumstances of his case fall within the ambit of this Court's jurisprudence on the right to present a defense. This he cannot do.

The petitioner relies primarily upon this Court's decisions in *Washington v. Texas*, 388 U.S. at 14; *Chambers v. Mississippi*, 410 U.S. 284, 93 S. Ct. 1038, 35 L. Ed. 2d 297 (1973); and *Rock v. Arkansas*, 483 U.S. at 44. However, these cases are inapposite. In each case, the defendant was prevented from presenting his or her version of the facts to the jury. In each case, the state evidentiary rule at issue either disadvantaged the defendant more than the prosecution without a rational basis, or arbitrarily excluded evidence that bore strong assurances of reliability. This Court's decisions in all three cases are very fact-bound; in each, the evidentiary rule at issue operated in a manner that, in light of the particular circumstances of the case, deprived the defendant of fundamental fairness.

In contrast, in the present case, the petitioner was allowed to present his version of the facts to the jury. The Connecticut Supreme Court's decision to bar polygraph evidence does not disadvantage defendants more than the prosecution, and does not arbitrarily exclude evidence that bears strong assurances of

reliability. Moreover, there is nothing in the circumstances of the petitioner's case to suggest that the exclusion of his polygraph results deprived him of a fundamentally fair trial. For these reasons, this Court should deny certiorari.[2]

This Court's Jurisprudence On The Right To Present A Defense

In *Washington v. Texas*, 388 U.S. at 16, the defendant was prevented, by a state evidentiary rule barring coparticipants in a crime from testifying for one another, from presenting a witness' testimony that the witness, not the defendant, shot the victim, and that before the shot was fired the defendant tried to persuade the witness to leave. This Court noted that the witness' testimony was "vital to the defense" because the witness "was the only person other than petitioner who knew exactly who had fired the shotgun and whether petitioner had at the last minute attempted to prevent the shooting." *Id.* This Court also noted that the evidentiary rule did not prevent a coparticipant in a crime from testifying for the State, or testifying for the defense after the coparticipant was acquitted at his own trial. *Id.* at 16-17, 22-23. This Court held that the rule was arbitrary and irrational because a coparticipant would have a greater incentive

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[2] This Court currently has pending before it the case of *United States of America v. Airman Edward G. Scheffer*, No. 96-1133. The *Scheffer* case raises the issue of whether Military Rule of Evidence 707, which proscribes the admission of polygraph evidence in court-martial proceedings, is violative of the constitutional right to present a defense. The State of Connecticut and twenty-eight states have filed a brief as amici curiae in support of the petitioner in the *Scheffer* case.

to lie for the prosecution in order to obtain favorable treatment, or to lie after an acquittal when he could not again be prosecuted for the same offense, than to lie for the defendant. *Id.* at 22-23. This Court held that the right to present a defense is "the right to present the defendant's version of the facts . . . to the jury," and that the exclusion of the testimony had deprived the defendant of his constitutional rights. *Id.* at 19, 23.

In *Chambers v. Mississippi*, 410 U.S. at 284, the defendant was prevented, by state evidentiary rules barring a party from impeaching his own witness or from introducing hearsay declarations against penal interest, from effectively confronting a witness, McDonald, who had given his attorney a sworn confession to the crime. At trial, the defendant presented eyewitness testimony that McDonald committed the murder. *Id.* at 289. The defendant called McDonald and introduced his confession into evidence, but during cross-examination by the State McDonald repudiated the confession. *Id.* at 291. The defendant moved to examine McDonald as an adverse witness and to introduce the testimony of three other witnesses to whom McDonald had admitted committing the crime. *Id.* at 291-92. The trial court denied both motions. *Id.* at 291-93.

This Court noted that "[a]s a consequence of the combination of Mississippi's 'party witness' or 'voucher' rule and its hearsay rule, [the defendant] was unable either to cross-examine McDonald or to present witnesses in his own behalf who would have discredited McDonald's repudiation and demonstrated his complicity." *Id.* at 294. This Court held that

the voucher rule, which prevented the defendant from impeaching McDonald after calling him as a witness, was antiquated and had impermissibly interfered with the defendant's right to confront and cross-examine witnesses. *Id.* at 295-98. This Court also noted that Mississippi limited its exception to the hearsay rule for declarations against interest to declarations against pecuniary interest, and that a number of states and the proposed federal rules of evidence had discarded such a limitation. *Id.* at 299. While the limitation was "usually premised on the view that admission [of declarations against penal interest] would lead to the frequent presentation of perjured testimony," McDonald's hearsay admissions "were originally made and subsequently offered at trial under circumstances that provided considerable assurance of their reliability." *Id.* at 299-300.[3]

Because the proffered testimony "bore persuasive assurances of trustworthiness" and was "critical" to the defense, the hearsay rule could not be applied mechanistically to defeat the ends of justice. *Id.* at 302. This Court concluded that the combination of the two rules had deprived the defendant of a fair trial, but limited its holding to the particular facts and circumstances of the case, stating, "we establish no new principles of

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[3] Each of McDonald's confessions was made spontaneously to a close acquaintance shortly after the murder, each was corroborated by some other evidence in the case, and McDonald did not stand to benefit by disclosing his culpability to any of the friends to whom he had confessed. *Chambers v. Mississippi*, 410 U.S. at 300-301. Moreover, McDonald was available for cross-examination by the State, so the jury could weigh his demeanor and responses. *Id.* at 301.

constitutional law . . . . [n]or does our holding signal any diminution in the respect traditionally accorded to the States in the establishment and implementation of their own criminal trial rules and procedures." *Id.* at 302-303.

Finally, in *Rock v. Arkansas*, 483 U.S. at 47-49, the defendant was prevented, by a state evidentiary rule barring the admission of hypnotically refreshed testimony, from testifying about anything she remembered about the crime after being hypnotized. Before hypnosis, the defendant, who was charged with manslaughter in the shooting death of her husband, could not remember the details of the shooting; after hypnosis, she was able to remember that she had not had her finger on the trigger of the gun and that the gun had fired accidentally when her husband grabbed her arm. *Id.* at 46-47. A gun expert examined the gun and determined that it was defective and prone to fire when hit or dropped, without the trigger being pulled. *Id.* at 47. The trial court nevertheless limited the defendant's testimony to what she had told the doctor who hypnotized her prior to the hypnosis. *Id.* at 47, 57.

This Court stated that "restrictions of a defendant's right to testify may not be arbitrary or disproportionate to the purposes they are designed to serve" and that "[i]n applying its evidentiary rules a State must evaluate whether the interests served by a rule justify the limitation imposed on the defendant's constitutional right to testify." *Id.* at 55-56. Application of the rule "had a significant adverse effect on petitioner's ability to testify" because it "virtually prevented her from describing any of the

events that occurred on the day of the shooting, despite corroboration of many of those events by other witnesses." *Id.* at 57. The defendant was not permitted to describe the actual shooting except in the words contained in the doctor's notes. *Id.* While other states had also adopted rules barring hypnotically refreshed testimony, their rules applied to the testimony of witnesses, not defendants. *Id.* This Court concluded that Arkansas had not "shown that hypnotically enhanced testimony is always so untrustworthy and so immune to the traditional means of evaluating credibility that it should disable a defendant from presenting her version of the events for which she is on trial." *Id.* at 61.

The Connecticut Supreme Court's Decision Does Not Conflict With This Court's Jurisprudence On The Right To Present A Defense

Polygraph evidence is qualitatively different from the types of evidence excluded in *Washington, Chambers* and *Rock.* Polygraph evidence is an opinion as to whether a person told the truth when asked certain relevant questions about the crime during an examination out of court. Polygraph evidence cannot provide the jury with any additional substantive facts or circumstances concerning the crime. When offered by a defendant who testifies at trial, its sole purpose is to bolster his or her credibility with an opinion that when the defendant denied committing the crime during a polygraph examination, he or she was telling the truth.

For example, in the present case, the petitioner sought to

admit evidence that he denied committing the crime during a polygraph examination, and that in the polygraphist's opinion no deception was indicated. Although this evidence was excluded, the petitioner was permitted to testify and assert an alibi defense, and was permitted to present other witnesses to support this defense. Unlike the defendants in *Washington*, *Chambers* and *Rock*, the petitioner was provided with a full opportunity to present his version of the facts to the jury. All he was prevented from doing was bolstering the credibility of his testimony with self-serving hearsay statements made during a polygraph examination, and with the polygraphist's opinion that no deception was indicated. Because polygraph evidence is collateral to the substantive factual issues of a case, its exclusion does not prevent a defendant from presenting his version of the facts to the jury.

For similar reasons, the petitioner's polygraph evidence was not "critical" to his defense in the sense that the excluded evidence in *Washington*, *Chambers* and *Rock* was critical. In those cases, the evidence was critical because the information it provided could not be obtained by the jury from another source. In contrast, juries long have been entrusted with determining whether a witness is telling the truth by observing the witness' testimony and evaluating it together with all the other facts and circumstances of the case. Because jurors are able to evaluate credibility without polygraph evidence, such evidence is not "critical."

In addition, the Connecticut Supreme Court's decision to

exclude polygraph evidence from state trials does not disadvantage the defense more than the prosecution without a rational basis, nor arbitrarily exclude defense evidence that bears strong assurances of reliability. The court held that polygraph evidence is per se inadmissible in state judicial proceedings that are subject to the rules of evidence. *State v. Porter*, 241 Conn. at 94, 115, 135 n.80. That holding prevents the prosecution and the defense alike from introducing such evidence. Thus, it is completely unlike the rule in *Washington v. Texas* that allowed the prosecution to offer the testimony of a coparticipant in the crime charged while preventing the defense from doing so, even though such testimony was less likely to be reliable if offered by the prosecution than if offered by the defense.

The Connecticut Supreme Court's decision to bar polygraph evidence also is not arbitrary, but rather is well-reasoned and based on strong policy considerations. The court's decision is not based on antiquated common-law presumptions or precepts, but rather upon a thorough review of the contemporary literature on the subject, a careful weighing of the probative value versus the potential prejudice of such evidence, and an examination of the policies and experiences of other states. A majority of the states still bar polygraph evidence, and four states that have experimented with admitting such evidence have deemed such experiments a failure. The accuracy of polygraph evidence is still widely debated and cannot be ascertained with any degree of certainty. In contrast to *Rock v. Arkansas*, Connecticut is not the only state that bars defendants from presenting polygraph

evidence. Unlike the evidentiary rules in *Chambers v. Mississippi*, Connecticut's rule is not antiquated and is not premised on a principle that lacks contemporary validity.

The Connecticut Supreme Court's decision represents a rational policy choice based upon a careful weighing of the probative value and prejudicial impact of polygraph evidence. Polygraph evidence does not contribute any facts relevant to the crime charged. It is relevant only to the issue of credibility, which the jury is competent to evaluate without expert testimony. Thus, polygraph evidence has little probative value. The questionable accuracy of polygraph results reduces the probative value of this evidence even further. On the other hand, the potential for prejudice is great. In the present case, the petitioner sought to admit a polygraph examiner's opinion that he was not being deceptive when he denied robbing Morcey's Restaurant. If a jury were to credit the polygraph examiner's opinion, it would have to acquit the defendant, regardless of his demeanor on the stand and regardless of all of the other evidence presented at trial. The Connecticut Supreme Court noted that "[v]ery few studies have been done on the influence that polygraph evidence has over juries, and the cumulative results of those studies are inconclusive." *State v. Porter*, 241 Conn. at 117. The court stated that "this uncertainty alone justifies the continued exclusion of polygraph evidence." *Id.* at 118. Because polygraph evidence is potentially dispositive of the question of guilt or innocence, it poses a serious threat to the administration of justice.

The petitioner essentially takes the position that any per se exclusion of evidence is arbitrary and violative of the constitutional right to present a defense. This position is insupportable. Requiring evidentiary hearings every time a defendant seeks to introduce polygraph evidence would place a tremendous burden on the state trial courts. This is especially true because polygraph evidence is potentially relevant in every criminal trial with respect to every defense witness.

In *Chambers* and *Rock*, this Court did not hold that per se rules of inadmissibility are always arbitrary and violative of the right to present a defense. Instead, this Court held that while rules barring hearsay and hypnotically refreshed testimony are based upon reliability concerns, there were strong reasons for believing that the evidence sought to be admitted in those cases was actually reliable. In *Rock*, the facts remembered by the defendant after hypnosis were corroborated by the testimony of an expert witness who examined the gun. In *Chambers*, McDonald's hearsay confessions were corroborated by the testimony of eyewitnesses to the crime and were made under circumstances bearing strong assurances of reliability.

In contrast, in the present case, the record is devoid of corroborative evidence or other circumstances indicating that the petitioner's polygraph evidence was reliable. The petitioner testified and called an alibi witness; however, both had motives for exculpating the petitioner, and their testimony was heavily impeached and contradicted by other witnesses. Moreover, because the validity of the theory underlying polygraphy itself is

questionable, there is nothing in the circumstances of an individual polygraph that can provide strong assurances of reliability. Thus, a per se rule of exclusion is justified.

Finally, there is nothing in the circumstances of this case to suggest that the petitioner was deprived of a fundamentally fair trial. He was allowed to present his version of the facts to the jury and to have the jury evaluate nis credibility. He testified and called an alibi witness. There is nothing in the record to indicate that his polygraph evidence bore strong assurances of reliability. In sum, there is nothing to bring the petitioner's case within the ambit of this Court's decisions in *Washington v. Texas*, *Chambers v. Mississippi*, and *Rock v. Arkansas*. Thus, the petition should be denied.

CONCLUSION

For the foregoing reasons, the petition for a writ of certiorari to the Supreme Court of the State of Connecticut should be denied.

Respectfully submitted,

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